LG

Service Manual

LG

# Service Manual

# KG245

Model : KG245

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# 1. INTRODUCTION

## 1.1 Purpose

This manual provides the information necessary to repair, calibration, description and download the features of this model.

## 1.2 Regulatory Information

### A. Security

Toll fraud, the unauthorized use of telecommunications system by an unauthorized part (for example, persons other than your company's employees, agents, subcontractors, or person working on your company's behalf) can result in substantial additional charges for your telecommunications services. System users are responsible for the security of own system. There are may be risks of toll fraud associated with your telecommunications system. System users are responsible for programming and configuring the equipment to prevent unauthorized use. The manufacturer does not warrant that this product is immune from the above case but will prevent unauthorized use of common-carrier telecommunication service of facilities accessed through or connected to it.
The manufacturer will not be responsible for any charges that result from such unauthorized use.

### B. Incidence of Harm

If a telephone company determines that the equipment provided to customer is faulty and possibly causing harm or interruption in service to the telephone network, it should disconnect telephone service until repair can be done. A telephone company may temporarily disconnect service as long as repair is not done.

### C. Changes in Service

A local telephone company may make changes in its communications facilities or procedure. If these changes could reasonably be expected to affect the use of the this phone or compatibility with the network, the telephone company is required to give advanced written notice to the user, allowing the user to take appropriate steps to maintain telephone service.

### D. Maintenance Limitations

Maintenance limitations on this model must be performed only by the manufacturer or its authorized agent. The user may not make any changes and/or repairs expect as specifically noted in this manual. Therefore, note that unauthorized alternations or repair may affect the regulatory status of the system and may void any remaining warranty.

## E. Notice of Radiated Emissions

This model complies with rules regarding radiation and radio frequency emission as defined by local regulatory agencies. In accordance with these agencies, you may be required to provide information such as the following to the end user.

## F. Pictures

The pictures in this manual are for illustrative purposes only; your actual hardware may look slightly different.

## G. Interference and Attenuation

Phone may interfere with sensitive laboratory equipment, medical equipment, etc.Interference from unsuppressed engines or electric motors may cause problems.

## H. Electrostatic Sensitive Devices

### ATTENTION

**Boards, which contain Electrostatic Sensitive Device (ESD), are indicated by the sign.**
**Following information is ESD handling:**

- Service personnel should ground themselves by using a wrist strap when exchange system boards.
- When repairs are made to a system board, they should spread the floor with anti-static mat which is also grounded.
- Use a suitable, grounded soldering iron.
- Keep sensitive parts in these protective packages until these are used.
- When returning system boards or parts like EEPROM to the factory, use the protective package as described.

## 1.3 Abbreviations

For the purposes of this manual, following abbreviations apply:

| | |
|---|---|
| APC | Automatic Power Control |
| BB | Baseband |
| BER | Bit Error Ratio |
| CC-CV | Constant Current - Constant Voltage |
| DAC | Digital to Analog Converter |
| DCS | Digital Communication System |
| dBm | dB relative to 1 milli watt |
| DSP | Digital Signal Processing |
| EEPROM | Electrical Erasable Programmable Read-Only Memory |
| ESD | Electrostatic Discharge |
| FPCB | Flexible Printed Circuit Board |
| GMSK | Gaussian Minimum Shift Keying |
| GPIB | General Purpose Interface Bus |
| GSM | Global System for Mobile Communications |
| IPUI | International Portable User Identity |
| IF | Intermediate Frequency |
| LCD | Liquid Crystal Display |
| LDO | Low Drop Output |
| LED | Light Emitting Diode |
| OPLL | Offset Phase Locked Loop |

# 1. INTRODUCTION

| | |
|---|---|
| PAM | Power Amplifier Module |
| PCB | Printed Circuit Board |
| PGA | Programmable Gain Amplifier |
| PLL | Phase Locked Loop |
| PSTN | Public Switched Telephone Network |
| RF | Radio Frequency |
| RLR | Receiving Loudness Rating |
| RMS | Root Mean Square |
| RTC | Real Time Clock |
| SAW | Surface Acoustic Wave |
| SIM | Subscriber Identity Module |
| SLR | Sending Loudness Rating |
| SRAM | Static Random Access Memory |
| PSRAM | Pseudo SRAM |
| STMR | Side Tone Masking Rating |
| TA | Travel Adapter |
| TDD | Time Division Duplex |
| TDMA | Time Division Multiple Access |
| UART | Universal Asynchronous Receiver/Transmitter |
| VCO | Voltage Controlled Oscillator |
| VCTCXO | Voltage Control Temperature Compensated Crystal Oscillator |
| WAP | Wireless Application Protocol |

# 2. PERFORMANCE

## 2.1 H/W Features

| Item | Feature | Comment |
|---|---|---|
| Standard Battery | Classification : Li-on<br>Capacity min 830mAh<br>Voltage :3.7V<br>Cell Weight : 22g | |
| Stand by Current | Under the minimum current consumption environment (such as paging period 9), the level of standby current is below 4mA. | |
| Talk time | Up to 2.5 hours (GSM TX Level 5) | |
| Stand by time | Up to 200 hours (Paging Period: 9, RSSI: -85 dBm) | |
| Charging time | Approx. Under 3 hours | |
| RX Sensitivity | GSM, EGSM: -107dBm, DCS: -107dBm | |
| TX output power | GSM, EGSM: 33dBm(Level 5),<br>DCS, PCS: 30dBm(Level 0) | |
| GPRS compatibility | Class 10 | |
| SIM card type | 3V Small | |
| Display | Main LCD : 128 x 160 260K TFT, 1.77”<br>Sub LCD : 96 x 64 65K OLED,1.04” | |
| Status Indicator | Hard icons. Key Pad<br>0 ~ 9, #, *, Up/Down Navigation Key<br>Menu Key, Clear Key<br>Send Key, END/PWR Key<br>Soft Key(Left/Right) | |
| ANT | Internal | |
| EAR Phone Jack | Yes (mono) | |
| PC Synchronization | Yes | |
| Speech coding | EFR/FR/HR | |
| Data and Fax | Yes | |
| Vibrator | Yes | |
| Loud Speaker | Yes | |
| Voice Recoding | Yes | |
| Microphone | Yes | |
| Speaker/Receiver | One way dual speaker | |
| Travel Adapter | Yes | |
| Bluetooth / USB | Yes | |
| MIDI | 64 Poly (Mono SPK) | |
| Options | Data Kit , CD | |
| Camera Module | Yes (VGA, CMOS) | |

## 2.2 Technical Specification

<table>
<tr><th>Item</th><th>Description</th><th colspan="6">Specification</th></tr>
<tr><td>1</td><td>Frequency Band</td><td colspan="6">EGSM<br>• TX: 890 + (n-1024) x 0.2 MHz<br>• RX: 935 + (n-1024) x 0.2 MHz (n=975~1024)<br>DCS<br>• TX: 1710 + (n-512) x 0.2 MHz<br>• RX: 1805 + (n-512) x 0.2 MHz (n=512~885)<br>PCS<br>• TX: 1810 + (n-512) x 0.2 MHz<br>• RX: 1905 + (n-512) x 0.2 MHz (n=512~810)</td></tr>
<tr><td>2</td><td>Phase Error</td><td colspan="6">RMS < 5 degrees<br>Peak < 20 degrees</td></tr>
<tr><td>3</td><td>Frequency Error</td><td colspan="6">< 0.1 ppm</td></tr>
<tr><td rowspan="20">4</td><td rowspan="20">Power Level</td><td colspan="6">GSM, EGSM</td></tr>
<tr><td>Level</td><td>Power</td><td>Toler.</td><td>Level</td><td>Power</td><td>Toler.</td></tr>
<tr><td>5</td><td>33 dBm</td><td>±2dB</td><td>13</td><td>17 dBm</td><td>±3dB</td></tr>
<tr><td>6</td><td>31 dBm</td><td>±3dB</td><td>14</td><td>15 dBm</td><td>±3dB</td></tr>
<tr><td>7</td><td>29 dBm</td><td>±3dB</td><td>15</td><td>13 dBm</td><td>±3dB</td></tr>
<tr><td>8</td><td>27 dBm</td><td>±3dB</td><td>16</td><td>11 dBm</td><td>±5dB</td></tr>
<tr><td>9</td><td>25 dBm</td><td>±3dB</td><td>17</td><td>9 dBm</td><td>±5dB</td></tr>
<tr><td>10</td><td>23 dBm</td><td>±3dB</td><td>18</td><td>7 dBm</td><td>±5dB</td></tr>
<tr><td>11</td><td>21 dBm</td><td>±3dB</td><td>19</td><td>5 dBm</td><td>±5dB</td></tr>
<tr><td>12</td><td>19 dBm</td><td>±3dB</td><td></td><td></td><td></td></tr>
<tr><td colspan="6">DCS, PCS</td></tr>
<tr><td>Level</td><td>Power</td><td>Toler.</td><td>Level</td><td>Power</td><td>Toler.</td></tr>
<tr><td>0</td><td>30 dBm</td><td>±2dB</td><td>8</td><td>14 dBm</td><td>±3dB</td></tr>
<tr><td>1</td><td>28 dBm</td><td>±3dB</td><td>9</td><td>12 dBm</td><td>±4dB</td></tr>
<tr><td>2</td><td>26 dBm</td><td>±3dB</td><td>10</td><td>10 dBm</td><td>±4dB</td></tr>
<tr><td>3</td><td>24 dBm</td><td>±3dB</td><td>11</td><td>8 dBm</td><td>±4dB</td></tr>
<tr><td>4</td><td>22 dBm</td><td>±3dB</td><td>12</td><td>6 dBm</td><td>±4dB</td></tr>
<tr><td>5</td><td>20 dBm</td><td>±3dB</td><td>13</td><td>4 dBm</td><td>±4dB</td></tr>
<tr><td>6</td><td>18 dBm</td><td>±3dB</td><td>14</td><td>2 dBm</td><td>±5dB</td></tr>
<tr><td>7</td><td>16 dBm</td><td>±3dB</td><td>15</td><td>0 dBm</td><td>±5dB</td></tr>
</table>

| Item | Description | Specification | |
|---|---|---|---|
| 5 | Output RF Spectrum (due to modulation) | **GSM, EGSM** | |
| | | Offset from Carrier (kHz). | Max. dBc |
| | | 100 | +0.5 |
| | | 200 | -30 |
| | | 250 | -33 |
| | | 400 | -60 |
| | | 600~ <1,200 | -60 |
| | | 1,200~ <1,800 | -60 |
| | | 1,800~ <3,000 | -63 |
| | | 3,000~ <6,000 | -65 |
| | | 6,000 | -71 |
| | | **DCS, PCS** | |
| | | Offset from Carrier (kHz). | Max. dBc |
| | | 100 | +0.5 |
| | | 200 | -30 |
| | | 250 | -33 |
| | | 400 | -60 |
| | | 600~ <1,200 | -60 |
| | | 1,200~ <1,800 | -60 |
| | | 1,800~ <3,000 | -65 |
| | | 3,000~ <6,000 | -65 |
| | | 6,000 | -73 |
| 6 | Output RF Spectrum (due to switching transient) | **GSM, EGSM** | |
| | | Offset from Carrier (kHz) | Max. (dBm) |
| | | 400 | -19 |
| | | 600 | -21 |
| | | 1,200 | -21 |
| | | 1,800 | -24 |

# 2. PERFORMANCE

<table>
<tr><th>Item</th><th>Description</th><th colspan="3">Specification</th></tr>
<tr><td rowspan="6">6</td><td rowspan="6">Output RF Spectrum<br>(due to switching transient)</td><td colspan="2">DCS, PCS</td><td></td></tr>
<tr><td colspan="2">Offset from Carrier (kHz).</td><td>Max. (dBm)</td></tr>
<tr><td colspan="2">400</td><td>-22</td></tr>
<tr><td colspan="2">600</td><td>-24</td></tr>
<tr><td colspan="2">1,200</td><td>-24</td></tr>
<tr><td colspan="2">1,800</td><td>-27</td></tr>
<tr><td>7</td><td>Spurious Emissions</td><td colspan="3">Conduction, Emission Status</td></tr>
<tr><td>8</td><td>Bit Error Ratio</td><td colspan="3">GSM, EGSM<br>BER (Class II) < 2.439% @-102 dBm<br>DCS, PCS<br>BER (Class II) < 2.439% @-100 dBm</td></tr>
<tr><td>9</td><td>RX Level Report Accuracy</td><td colspan="3">±3 dB</td></tr>
<tr><td>10</td><td>SLR</td><td colspan="3">8 ±3 dB</td></tr>
<tr><td rowspan="10">11</td><td rowspan="10">Sending Response</td><td>Frequency (Hz)</td><td>Max.(dB)</td><td>Min.(dB)</td></tr>
<tr><td>100</td><td>-12</td><td>-</td></tr>
<tr><td>200</td><td>0</td><td>-</td></tr>
<tr><td>300</td><td>0</td><td>-12</td></tr>
<tr><td>1,000</td><td>0</td><td>-6</td></tr>
<tr><td>2,000</td><td>4</td><td>-6</td></tr>
<tr><td>3,000</td><td>4</td><td>-6</td></tr>
<tr><td>3,400</td><td>4</td><td>-9</td></tr>
<tr><td>4,000</td><td>0</td><td>-</td></tr>
<tr><td>12</td><td>RLR</td><td colspan="3">2 ±3 dB</td></tr>
<tr><td rowspan="11">13</td><td rowspan="11">Receiving Response</td><td>Frequency (Hz)</td><td>Max.(dB)</td><td>Min.(dB)</td></tr>
<tr><td>100</td><td>-12</td><td>-</td></tr>
<tr><td>200</td><td>0</td><td>-</td></tr>
<tr><td>300</td><td>2</td><td>-7</td></tr>
<tr><td>500</td><td>*</td><td>-5</td></tr>
<tr><td>1,000</td><td>0</td><td>-5</td></tr>
<tr><td>3,000</td><td>2</td><td>-5</td></tr>
<tr><td>3,400</td><td>2</td><td>-10</td></tr>
<tr><td>4,000</td><td>2</td><td></td></tr>
<tr><td colspan="3">* Mean that Adopt a straight line in between 300 Hz and 1,000 Hz to be Max. level in the range.</td></tr>
</table>

| Item | Description | Specification | |
|---|---|---|---|
| 14 | STMR | 13 ±5 dB | |
| 15 | Stability Margin | > 6 dB | |
| 16 | Distortion | dB to ARL (dB) | Level Ratio (dB) |
| | | -35 | 17.5 |
| | | -30 | 22.5 |
| | | -20 | 30.7 |
| | | -10 | 33.3 |
| | | 0 | 33.7 |
| | | 7 | 31.7 |
| | | 10 | 25.5 |
| 17 | Side Tone Distortion | Three stage distortion < 10% | |
| 18 | System frequency (13 MHz) tolerance | ≤ 2.5ppm | |
| 19 | 32.768KHz tolerance | ≤ 30ppm | |
| 20 | Ringer Volume | At least 65 dBspl under below conditions:<br>1. Ringer set as ringer.<br>2. Test distance set as 50 cm | |
| 21 | Charge Current | Fast Charge : < 450 mA<br>Pre Charge : < 100 mA | |
| 22 | Antenna Display | Antenna Bar Number | Power |
| | | 5 | -85 dBm ~ |
| | | 4 | -90 dBm ~ -86 dBm |
| | | 3 | -95 dBm ~ -91 dBm |
| | | 2 | -100 dBm ~ -96 dBm |
| | | 1 | -105 dBm ~ -101 dBm |
| | | 0 | ~ -105 dBm |
| 23 | Battery Indicator | Battery Bar Number | Voltage |
| | | 0 | 3.51 ~ 3.61 V |
| | | 1 | 3.62 ~ 3.69 V |
| | | 2 | 3.70 ~ 3.77 V |
| | | 3 | 3.78 ~ 3.91 V |
| | | 4 | 3.92 V ~ |
| 24 | Low Voltage Warning | 3.62 ± 0.03V (Call) | |
| | | 3.50 ± 0.03V (Standby) | |

# 2. PERFORMANCE

| Item | Description | Specification |
|---|---|---|
| 25 | Forced shut down Voltage | 3.35±0.03 V |
| 26 | Battery Type | 1 Li-ion Battery<br>Standard Voltage = 3.7 V<br>Battery full charge voltage = 4.2 V<br>Capacity: 830mAh |
| 27 | Travel Charger | Switching-mode charger<br>Input: 100 ~ 240 V, 50/60 Hz<br>Output: 5.2 V, 800 mA |

# 3. TECHNICAL BRIEF

## 3.1 Transceiver (SI4210, U401)

The RF parts consist of a transmitter part, a receiver part, a frequency synthesizer part, a voltage supply part, and a VCTCXO part.
The Aero 2 transceiver is the integrated RF front end for multi-band GSM/GPRS digital cellular handsets and wireless data modems. The integrated solution eliminates the IF SAW filter, external low noise amplifier (LNAs) for three bands, transmit and RF voltage controlled oscillator (VCO modules, and other discrete components found in conventional designs.)

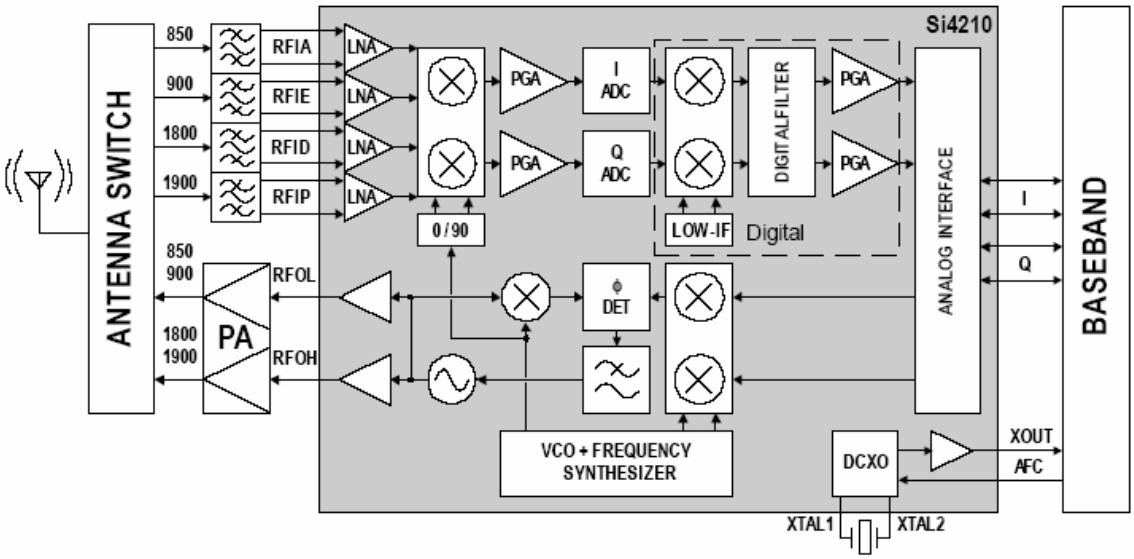



**Figure. 3-1 RECEIVER FUNCTIONAL BLOCK DIAGRAM**

## (1) Receiver Part

The Aero 2 transceiver uses a low-IF receiver architecture which allows for the on chip integration of the channel selection filters, eliminating the external RF image reject filters and the IF SAW filter required in conventional super-heterodyne architectures.

## A. RF front end

RF front end consists of Front End Module(FL400) and dual band LNAs integrated in transceiver (U401). The Received RF signals(GSM 925MHz ~ 960MHz, DCS 1805MHz ~ 1880MHz PCS 1905MHz ~ 1980MHz) are fed into the antenna or Mobile switch.
The Front End Module(FL500) is used to control the Rx and Tx paths. And, the input signals ANT_SW1, ANT_SW2 of a FL400 are directly connected to baseband controller to switch either Tx or Rx path on.
The logic and current is given below Table 3-1

| | **ANT_SW1** | **ANT_SW2** |
|---|---|---|
| GSM Tx | 2.5 ~ 3.0 0 V | 0V |
| DCS, PCS Tx | 0V | 2.5 ~ 3.0 V |
| GSM Rx | 0V | 0 V |
| DCS, PCS Rx | 0V | 0 V |

**Table 3-1 THE LOGIC AND CURRENT**

Three differential-input LNAs are integrated in SI4205. The GSM input supports the GSM 850 (864-894MHz) or E-GSM 900 (925-960MHz) bands. The DCS input supports the DCS 1800 (1805-1880 MHz) band. The PCS input supports the PCS 1900 (1930-1990 MHz) band.
The LNA inputs are matched to the 150 balanced output SAW filters through external LC matching networks. The LNA gain is controlled with the LNAG[1:0] and LNAC[1:0] bits in register 05h (Figure 3-2).

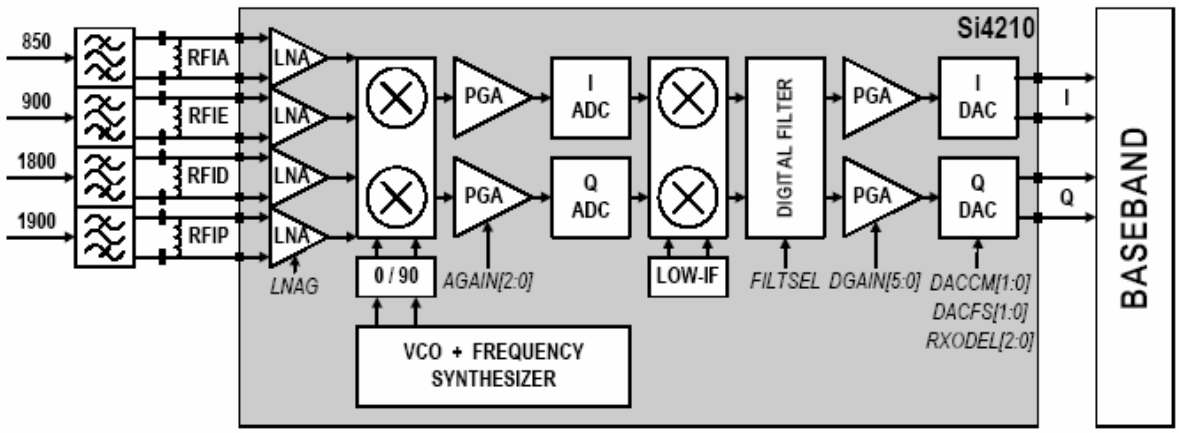



**Figure. 3-2 SI4210 RECEIVER PART**

## B. Intermediate frequency (IF) and Demodulation

A quadrature image-reject mixer downconverts the RF signal to a 100KHz intermediate frequency (IF) with the RFLO from the frequency synthesizer. The RFLO frequency is between 1737.8 to 1989.9 MHz, and is internally divided by 2 for GSM 850 and E-GSM 900 modes. The mixer output is amplified with an analog programmable gain amplifier (PGA), which is controlled with the AGAIN[2:0] bits in register 05h (Figure3-2). The quadrature IF signal is digitized with high resolution A/D converters (ADCs).

The ADC output is downconverted to baseband with a digital 100KHz quadrature LO signal. Digital decimation and IIR filters perform channel selection to remove blocking and reference interference signals. The selectivity setting (CSEL=0) or a low selectivity setting (CSEL=1). The low selectivity filter has a flatter group channelization filter is in the baseband chip. After channel selection, the digital output is scaled with a digital PGA, which is controlled with the DGAIN [5:0] bits in register 05h.

The amplified digital output signal go through with DACs that drive a differential analog signal onto the RXIP,RXIN,RXQP and RXQN pins to interface to standard analog ADC input baseband ICs. No special processing is required in the baseband for offset compensation or extended dynamic range.

Compared to a direct-conversion architecture, the low-IF architecture has a much greater degree of immunity to dc offsets that can arise from RF local oscillator(RFLO) self-mixing, 2nd order distortion of blockers, and device 1/f noise.

## (2) Transmitter Part

The transmit (Tx) section consists of an I/Q baseband upconverter, and offset phase-locked loop (OPLL) and two output buffers that can drive external power amplifiers (PA), one for the GSM 850 (824-849 MHz) and E-GSM 900 (880-915 MHz) bands and one for the DCS 1800 (1710-1785 MHz) and PCS 1900 (1850-1910MHz) bands.

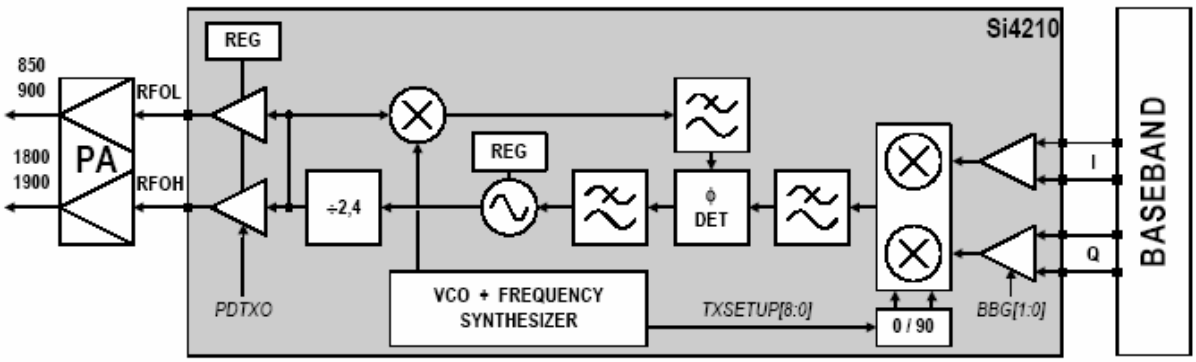



**Figure. 3-3 SI4210 TRANSMITTER PART**

## A. IF Modulator

The baseband converter(BBC) within the GSM chipset generates I and Q baseband signals for the Transmit vector modulator. The modulator provides more than 40dBc of carrier and unwanted sideband rejection and produces a GMSK modulated signal. The baseband software is able to cancel out differential DC offsets in the I/Q baseband signals caused by imperfections in the D/A converters. The Tx-Modulator implements a quadrature modulator. A quadrature mixer upconverts the differential in-phase (TXIP, TXIN) and quadrature (TXQP, TXQN) signals with the IFLO to generate a SSB IF signal that is filtered and used as the reference input to the OPLL.

The IFLO frequency is generated between 766 and 896 MHz and internally divided by 2 to generate the quadrature LO signals for the quadrature modulator, resulting in an IF between 383 and 448 MHz.
For the E-GSM 900 band, two different IFLO frequencies are required for spur management.
Therefore, the IF PLL must be programmed per channel in the E-GSM 900 band.

### B. OPLL

The OPLL consists of a feedback mixer, a phase detector, a loop filter, and a fully integrated TXVCO. The TXVCO is centered between the DCS 1800 and PCS 1900 bands, and its output is divided by 2 for the GSM 850 and E-GSM 900 bands. The RFLO frequency is generated between 1272 and 1483 MHz. To allow a single VCO to be used for the RFLO, high-side injection is used for the GSM 850 and E-GSM 900 bands, and low-side injection is used for the DCS 1800 and PCS 1900 bands. The I and Q signals are automatically swapped when switching bands. Additionally, the SWAP bit in register 03h can be used to manually exchange the I and Q signals.

Low-pass filters before the OPLL phase detector reduce the harmonic content of the quadrature modulator and feedback mixer outputs. The cutoff frequency of the filters is programmable with the FIF[3:0] bits in register 04h (Figure 3-3), and should be set to the recommended settings detailed in the register description.

## 3.2 PAM (SKY77328, U500)

The SKY77328 Power Amplifier Module (PAM) is designed in a low profile (1.2 mm), compact form factor for quad-band cellular handsets comprising GSM850/900, DCS1800, and PCS1900 operation. The PAM also supports Class 12 General Packet Radio Service (GPRS) multi-slot operation.
The module consists of separate GSM850/900 PA and DCS1800/PCS1900 PA blocks, impedance-matching circuitry for 50 Ω input and output impedances, and a Power Amplifier Control (PAC) block with an internal current-sense resistor.

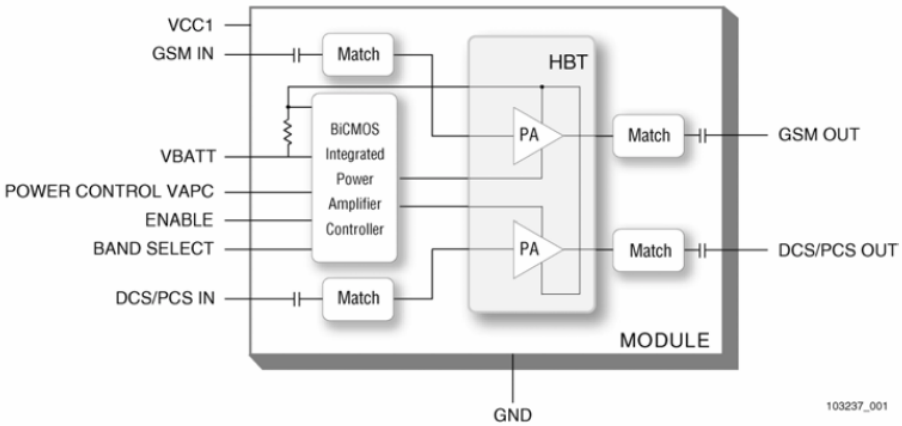



**Figure. 3-4 SKY77328**

## 3.3 26 MHz Clock (VCTCXO, X400)

The 26 MHz clock(X400) consists of a VCTCXO(Temperature Compensated Crystal Oscillator) which oscillates at a frequency of 26 MHz. It is used within the Si4205, analog base band chipset (U101, AD6537B), digital base band chipset (U102, AD6527)

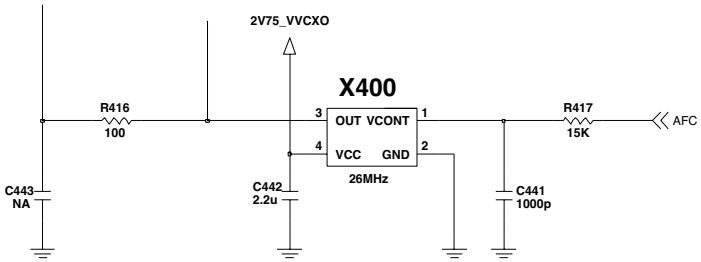



**Figure 3-5 VCTCXO CIRCUIT DIAGRAM**

## 3.4 Power Supplies for RF Circuits (RF LDO, U403)

Two regulators are used for RF circuits. One is MIC5255 (U403), and the other is one port of AD6537B (U101). MIC5255 (U403) supplies power to transceiver (SI4210, U401). One port of AD6537B supplies power to VVCXO (X400). Main power (VBAT) from battery is used for PAM (SKY77328, U400) because PAM requires high power.

| Supplier | Voltage | PowersPowers | enabled signal |
|---|---|---|---|
| U403(RF) | 2.85 V | U401 | CLKON |
| U102(VVCXO) | 2.75 V | X400 | |
| Battery(VBAT) | 3.4 ~ 4.2 V | U400, U403 | |

**Table 3-2 RF POWER SUPPLIERS**

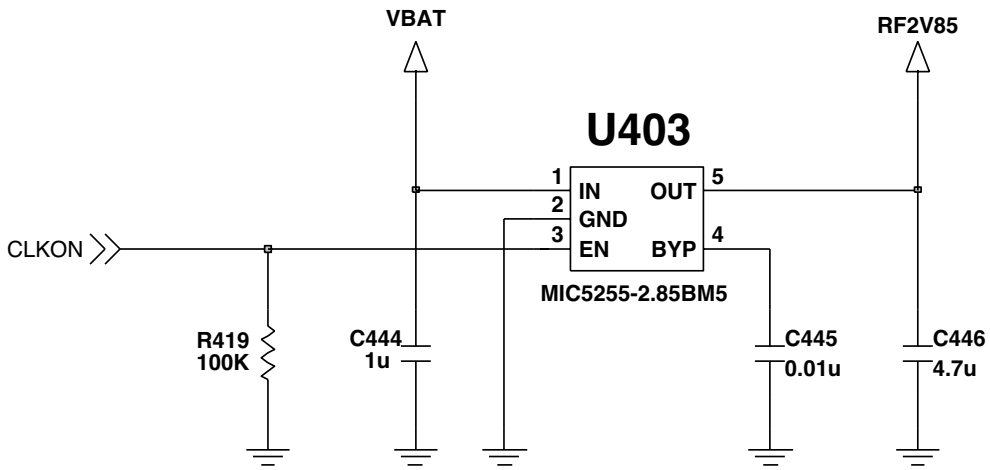



**Figure 3-6 RF LDO CIRCUIT DIAGRAM**

## 3.5 Digital Main Processor (AD6527, U102)

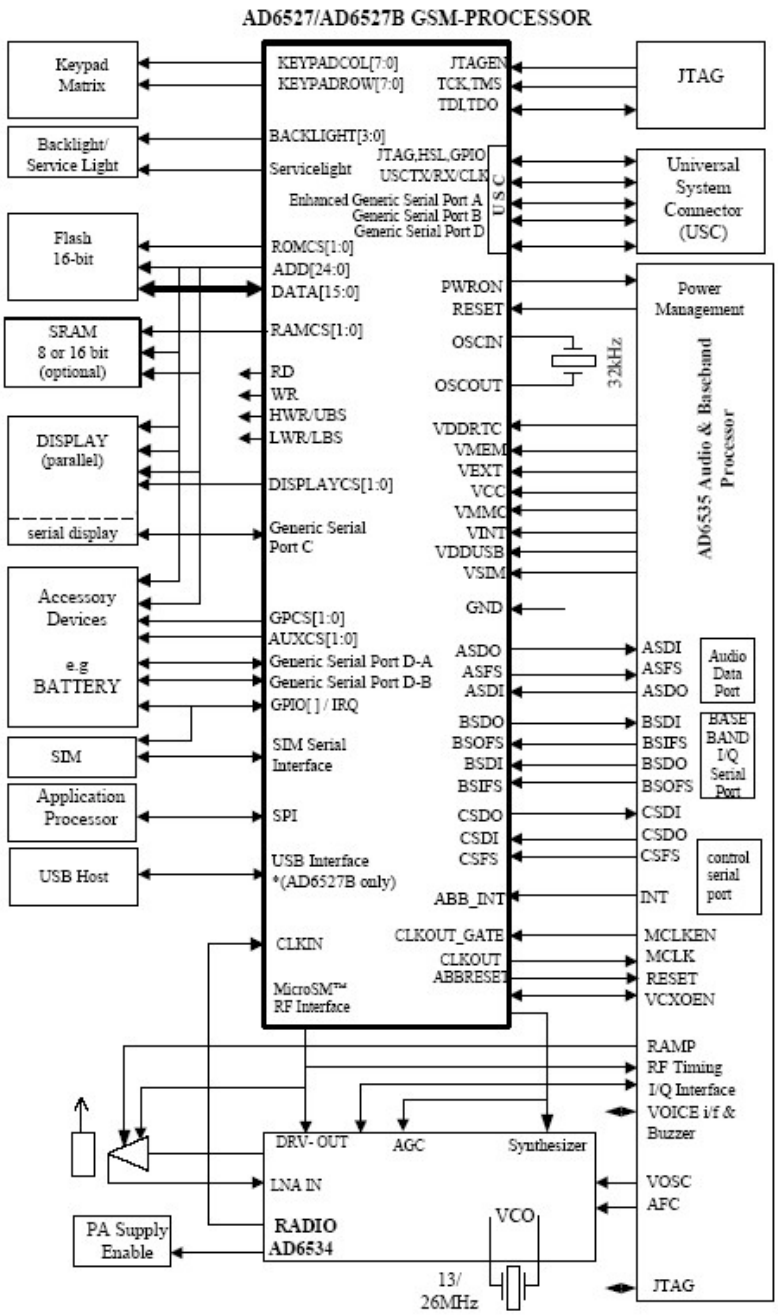



**Figure 3-7. SYSTEM INTERCONECTION OF AD6527 EXTERNAL INTERFACE**

• AD6527 is an ADI designed processor.

• AD6527 consists of

1. Control Processor Subsystem
   - 32-bit ARM7TDMI Control Processor
   - 58.5 MHz operation at 1.7V
   - On-board 16KB instruction/Data Cache
   - 1 Mbits of on-chip System SRAM

2. DSP Subsystem
   - 16-bit Fixed Point DSP Processor
   - 91 MIPS at 1.7V
   - 16K word Data and 16K word Program SRAM
   - 4K word Program Instruction Cache
   - Architecture supports Full Rate, Enhanced Full Rate, Half Rate, and AMR Speech Encoding/Decoding Algorithms

3. Peripheral Subsystem
   - Shared on-chip peripheral and off-chip interface:
   - Support for Burst and Page Mode Flash
   - Support for Pseudo SRAM
   - Ciphering module for GPRS supporting GAE1 and GAE2 encryption algorithms
   - Parallel and Serial Display Interface
   - 8 x 8 Keypad Interface
   - Four independent programmable backlight plus One Service Light
   - 1.8V and 3.0V, 64 kbps SIM interface
   - Universal System Connector Interface
   - Slow, Medium and Fast IrDA transceiver interface
   - Enhanced Generic Serial Port
   - Dedicated SPI interface
   - Thumbwheel Interface
   - JTAG Interface for Test and In-Circuit Emulation

4. Other
   - Supports 13 MHz and 26 MHz Input Clocks
   - 1.8V Typical Core Operating Voltages
   - 204-Ball LFBGA(mini-BGA) Package

5. Applications
   - GSM900/DCS1800/PCS1900/PCS850 Wireless Terminals
   - GSM Phase 2+ Compliant
   - GPRS Class 12 Compliant
   - Multimedia Services(MMS)
   - Extended Messaging System(EMS)

## 3.5.1 Interconnection with external devices

### A. RTC block interface

Countered by external X-TAL
The X-TAL oscillates 32.768KHz

### B. LCD module interface

The LCD module is controlled by CAMERA IC, CL765A
If CL765A is in the state of by-pass mode, the LCD control signals from AD6527 are by-passed through CL765A.
In operating mode, the CL765A controls the LCD module through L_MAIN_LCD_CS, L_SUB_LCD_CS, LCD_RESET, LCD_RS, LCD_WR, LCD_RD, L_DATA[15-00], 2V8_MV,1.8_MV.

| Signals | Description |
|---|---|
| L_MAIN_LCD_CS | MAIN LCD driver chip enable. MAIN LCD driver IC has own CS pin |
| L_SUB_LCD_CS | SUB LCD driver chip enable. SUB LCD driver IC has own CS pin |
| LCD_RESET (GPIO 15) | This pin resets LCD module. This signal comes from DBB directly. |
| LCD_WR | Enable writing to LCD Driver. |
| LCD_RD | Enable reading to LCD Driver. |
| LCD_RS | This pin determines whether the data to LCD module are display data or control data. LCD_RS can select 16 bit parallel bus. |
| 2V8_MV,1V8_MV | 2.85V voltage is supplied to LCD driver IC. |
| LCD_SIGNAL1 (GPIO_16) LCD_SIGNAL2 (GPIO_17) | For the future. |

**Table 3-3. LCD CONTRON SIGNALS DISCRIPTION**

### C. RF interface

The AD6527 control RF parts through PA_BAND, ANT_SW1, ANT_SW2, CLKON , PA_EN, SEN, SDATA, SCLK, RF_PWR_DWN.

| Signals | Description |
|---|---|
| PA_BAND (GPO 17) | PAM Band Select |
| ANT_SW1 (GPO 9) | Antenna switch Band Select |
| ANT_SW2 (GPO 11) | Antenna switch Band Select |
| CLKON | RF LDO Enable/Disable |
| PA_EN (GPO 16) | PAM Enable/Disable |
| S_EN (GPO 19) | PLL Enable/Disable |
| S_DATA (GPO 20) | Serial Data to PLL |
| S_CLK (GPO 21) | Clock to PLL |
| RF_EN (GPO 4) | Power down Input |

**Table 3-5. SIM CONTROL SIGNALS DESCRIPTION**

### D. Key interface

Include 5 column , 5 row and additional GPIO 35 for KEY_ROW5. The AD6527 detects whether key is pressed or not by using interrupt method.

### E. AD6537B Interrupt

AD6537B provides an active-high interrupt output signal. Interrupt signals are generated by the Auxiliary ADC, audio, and charger modules.

### F. SIM interface

The AD6527 provides SIM Interface Module. The AD6527 checks status periodically during established call mode whether SIM card is inserted or not, but it doesn't check during deep Sleep mode. In order to communicate with SIM card, 3 signals SIM_DATA, SIM_CLK, SIM_RST(GPIO_23)
are required. The descriptions about the signals are given by bellow Table 3-6 in detail.

| Signals | Description |
|---|---|
| SIM_DATA | This pin receives and sends data to SIM card. This model can support 1.8volt and 3.0 volt interface SIM card. |
| SIM_CLK | Clock 3.25MHz frequency. |
| SIM_RST (GPIO_23) | Reset SIM block |

**Table 3-6. SIM CONTRON SIGNALS DISCRIPTION**

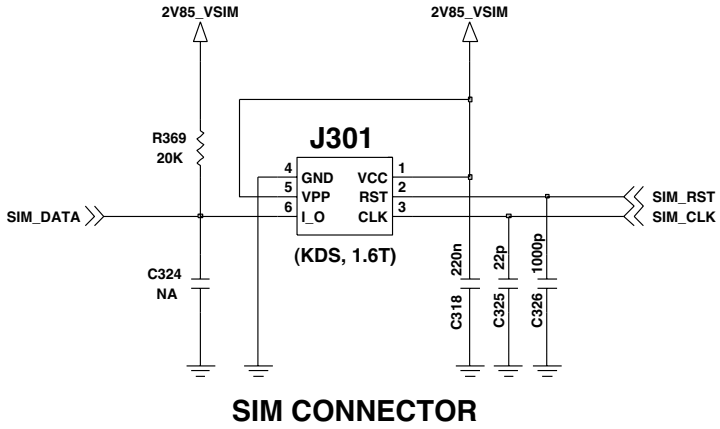



**Figure 3-8. SIM Interface of AD6527**

## 3.5.2 AD6527 Architecture

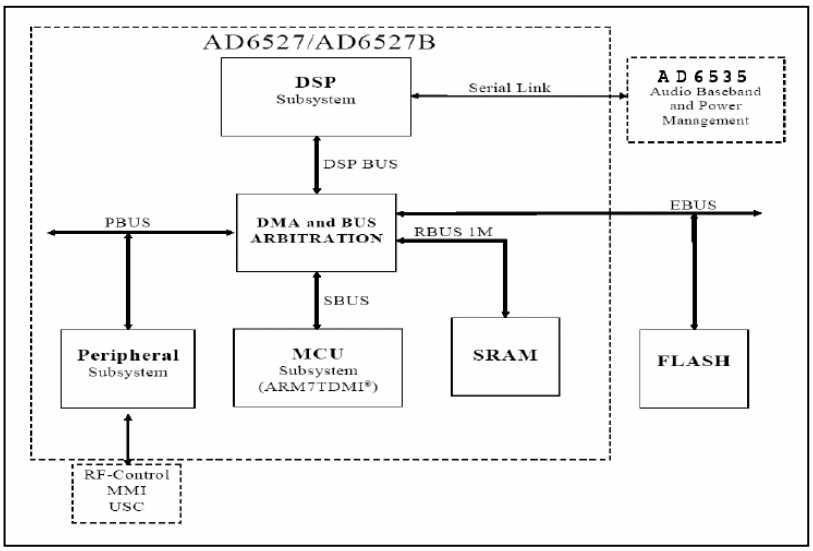



**Figure 3-9. AD6527 Architecture**

The internal architecture of AD6527 is shown above Figure 3-10. AD6527 regroups three main subsystems connected together through a dynamic and flexible communication bus network. It also includes onboard system RAM (SRAM) and interfaces with external Flash Memory, Baseband converter functions, and terminal functions like MMI, SIM and Universal System Connector (USC).

The Digital Signal Processing (DSP) subsystem primarily hosts all the speech processing, channel equalization and channel codec functions. The code used to implement such functions can be stored in external Flash Memory and dynamically downloaded on demand into the DSP's program RAM and Instruction Cache.

The micro-controller subsystem supports all the GSM terminal software, including the layer 1, 2 and 3 of the GSM protocol stack, the MMI, and applications software such as data services, test and maintenance. It is tightly associated with on-chip system SRAM and also includes boot ROM memory with a small dedicated routine to facilitate the initialization of the external Flash Memory via code download using the on-chip serial interface to the external Flash Memory interface.

The peripheral subsystem is composed of system peripherals such as interrupt controller, real time clock, watch dog timer, power management and a timing and control module. It also includes peripheral interfaces to the terminal functions: keyboard, battery supervision, radio and display. Both the DSP and the MCU can access the peripheral subsystem via the peripheral bus (PBUS).

For program and data storage, both the MCU subsystem and the DSP subsystem can access the on chip system SRAM and external memory such Flash Memory. The access to the SRAM module is made through the RAM Bus (RBUS) under the control of the bus arbitration logic. Similarly, access to the Flash Memory is through the parallel External Bus (EBUS).

## 3.6 Analog Main & Power Management Processor (AD6537B, U101)

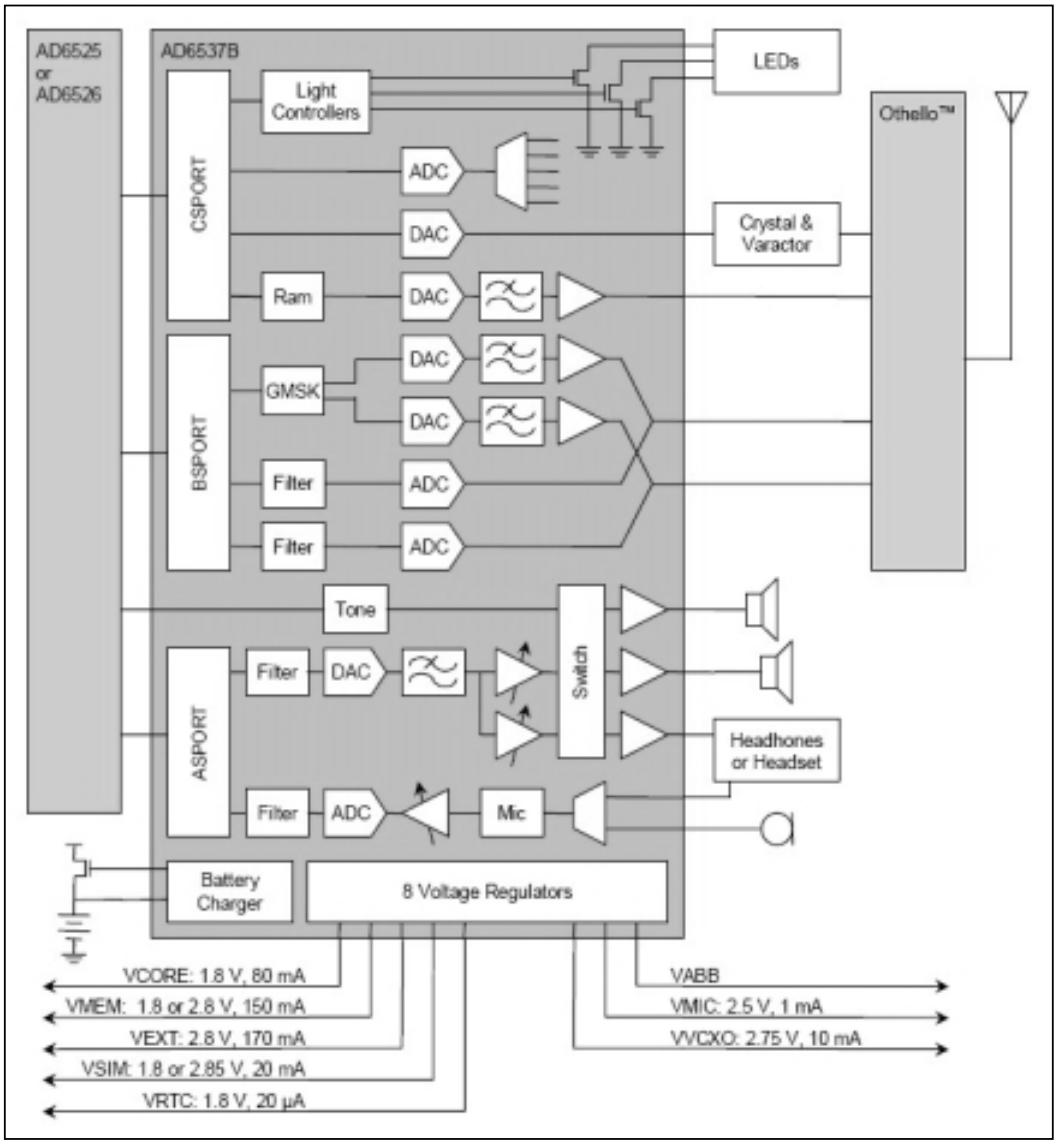



**Figure 3-10. AD6537B FUNCTIONAL BLOCK DIAGRAM**

• AD6537B is an ADI designed Analog Baseband processor. AD6537B covers the processing GMSK modulation interface, Aux ADC, Voice signal processing and Power Management.

• AD6537B consists of

1. BB Transmit section
   • GMSK Modulation
   • I-channel & Q-channel Transmit DACs and Filters
   • Power Ramping DAC

2. BB Receive section
   • I-channel & Q-channel Receive ADCs and Filters

3. Auxiliary section
   • Voltage Reference
   • Automatic Frequency Control DAC
   • Auxiliary ADC
   • Light Controllers

4. Audio Section
   • 8 kHz & 16 kHz Voiceband Codec
   • 48 kHz Monophonic DAC
   • Power Amplifiers

5. Power Management section
   • Voltage Regulators
   • Battery Charger
   • Battery Protection

6. Digital Processor section
   • Control, Baseband, and Audio Serial Ports
   • Interrupt Logic

## 3.6.1 Baseband Transmit Section

1. The AD6537B Baseband Transmit Section is designed to support GMSK for both single-slot and multi-slot application.
2. The transmit channel consists of a digital GMSK modulator, a matched pair of 10-bit DACs and a matched pair of reconstruction filter.

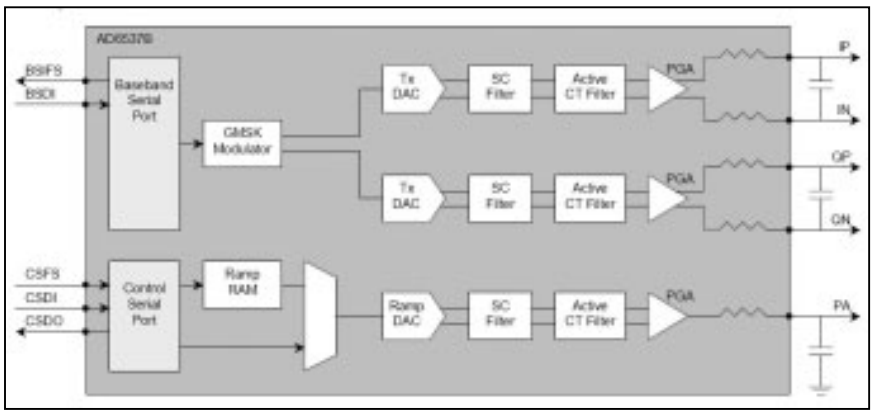



**Figure 3-11. AD6537B BASEBAND TRANSMIT SECTION**

## 3.6.2 Baseband Transmit Section

1. This section consists of two identical ADC channels that process baseband in-phase(I) and quadrature(Q) input signals.

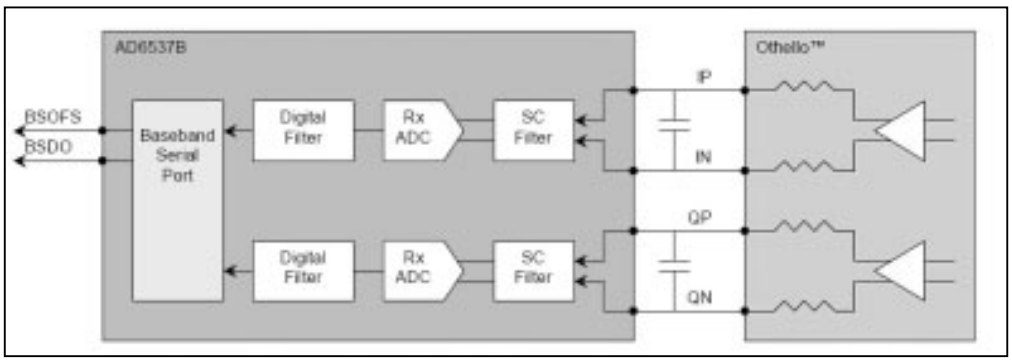



**Figure 3-12. AD6537B BASEBAND RECEIVER SECTION**

### 3.6.3 Auxiliary Section

1. This section includes an Automatic Frequency Control(AFC) DAC, voltage reference buffers, an Auxiliary ADC, and light controllers.
   • AFC DAC: 13 bits

2. This section also contains AUX ADC and Voltage Reference
   • IDAC: 10 bits
   • The Auxiliary ADC provides :
   - Two differential inputs for temperature sensing.
   - A differential input for the battery charger current sensor

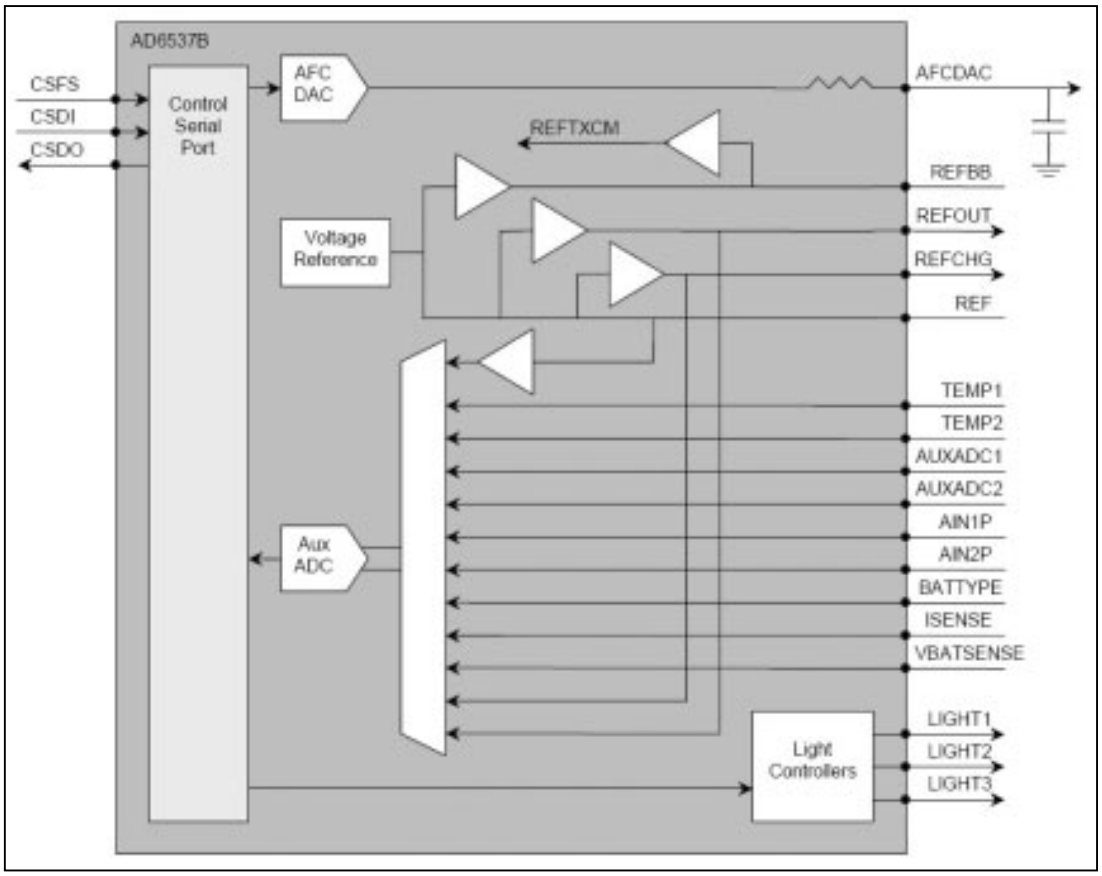



**Figure 3-13. AD6537B AUXILIARY SECTION**

### 3.6.4 Audio Section

1. Receive audio signal from microphone. This model uses differential configuration.
2. Send audio signal to speaker. This model uses differential configuration.
3. This section provides an audio codec with a digital-to-analog converter and an analogto-digital converter, a ring tone volume controller, a microphone interface, and multiple analog input and output channels.
4. It interconnects with external devices like main microphone, main receiver, and headset. The descriptions of audio port used in This model are given bellow in detail.

<Up Link>
-AIN1P,AIN1N : Main microphone positive/negative terminal
-AIN2P,AIN2N : Headset microphone positive/negative terminal
-AIN3P,AIN3N : External Analog Input terminal

<Down Link>
-AOUT1P,AOUT1N : Main Speaker positive/negative terminal
-AOUT3P : Headset speaker terminal

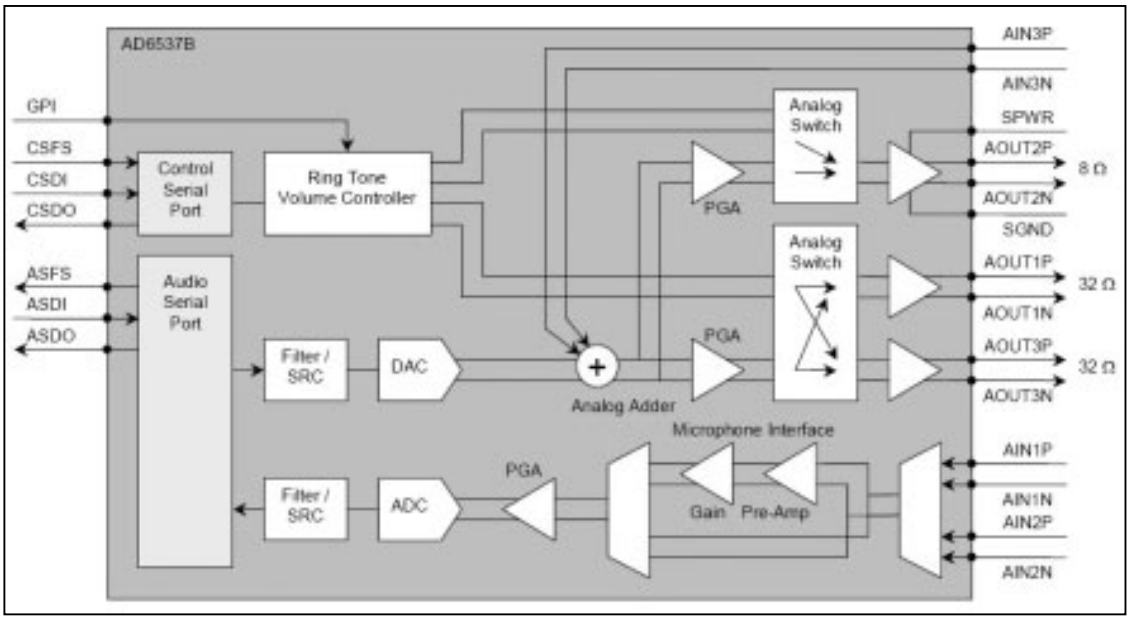



**Figure 3-14. AD6537B AUDIO SECTION**

### 3.6.5 Power Management

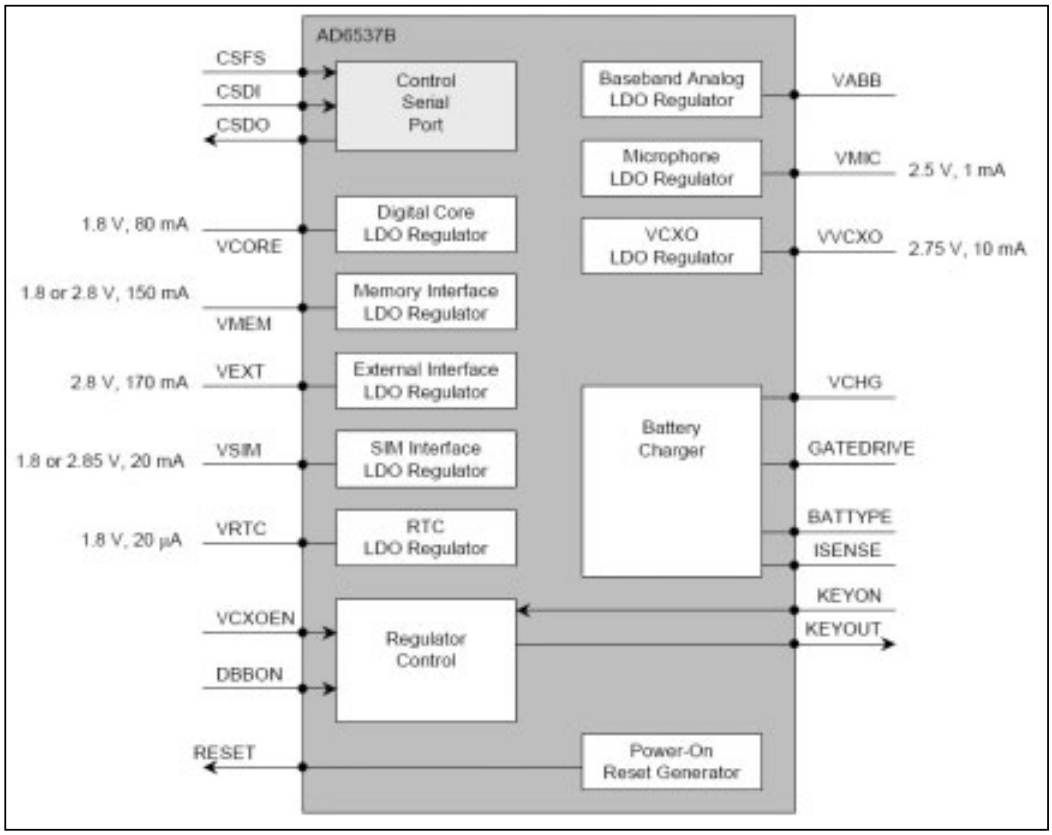



**Figure 3-15. AD6537B POWER MANAGEMENT SECTION**

#### 1. Power up sequence logic

1. The AD6537B controls power on sequence
2. Power on sequence
   - If a battery is inserted, the battery powers the 8 LDOs.
   - Then if PWRONKEY is detected, the LDOs output turn on.
   - REFOUT is also enabled
   - Reset is generated and send to the AD6527

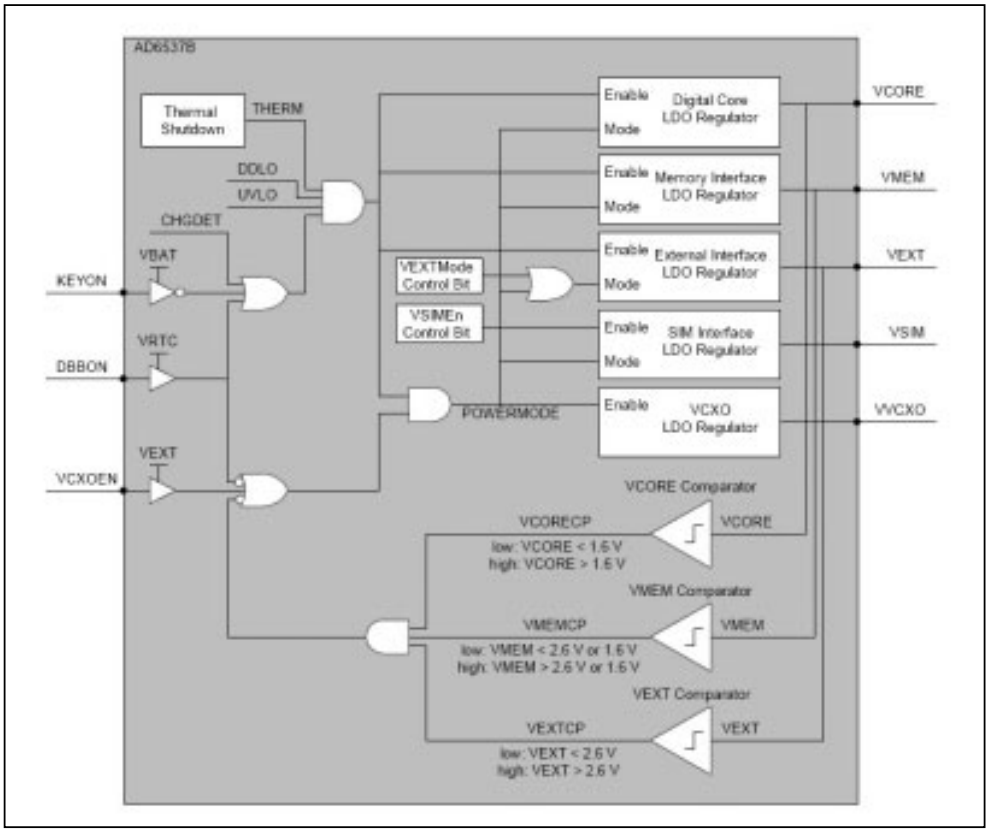



**Figure 3-16. AD6537B POWER MODE LOGIC**

## 2. LDO Block

1. There are 8 LDOs in the AD6537B.
   - VCORE : supplies Digital baseband Processor core and AD6537B digital core (1.8V, 80mA)
   - VMEM : supplies external memory and the interface to the external memory on the digital baseband processor (1,8V or 2.8V, 150mA)
   - VEXT : supplies Radio digital interface and high voltage interface (2.8V, 170mA)
   - VSIM : supplies the SIM interface circuitry on the digital processor and SIM card (1.8V or 2.85V, 20mA)
   - VRTC : supplies the Real-Time Clock module (1.8 V, 20 $\mu$A)
   - VABB : supplies the analog portions of the AD6537B
   - VMIC : supplies the microphone interface circuitry (2.5 V, 1 mA)
   - VVCXO : supplies the voltage controlled crystal oscillator ( 2.75 V, 10 mA)

### 3. Battery Charging Block

1. It can be used to charge Lithium Ion and/or Nickel Metal Hydride batteries. Charger initialization, trickle charging, and Li-Ion charging control are implemented in hardware.
2. Charging Process
   - Check charger is inserted or not
   - If AD6537B detects that Charger is inserted, the CC-CV charging starts.
   - Exception : When battery voltage is lower than 3.2V, the precharge(low current charge mode) starts firstly.
   - And the battery voltage reach to 3.2V the CC-CV charging starts.
3. Pins used for charging
   - GATEDRIVE : charge DAC output
   - ISENSE : charge current sense input
   - VBATSENSE : battery voltage sense input.
   - BATTYPE : battery type identification input
   - REFCHG : voltage reference output
4. TA (Travel Adaptor)
   - Input voltage: AC 85V ~ 260V, 50~60Hz
   - Output voltage: DC 5.2V ( 0.2 V )
   - Output current: Max 800mA ( 50mA )
5. Battery
   - Li-ion battery (Max 4.2V, Nom 3.7V)
   - Standard battery: Capacity - 830mAh

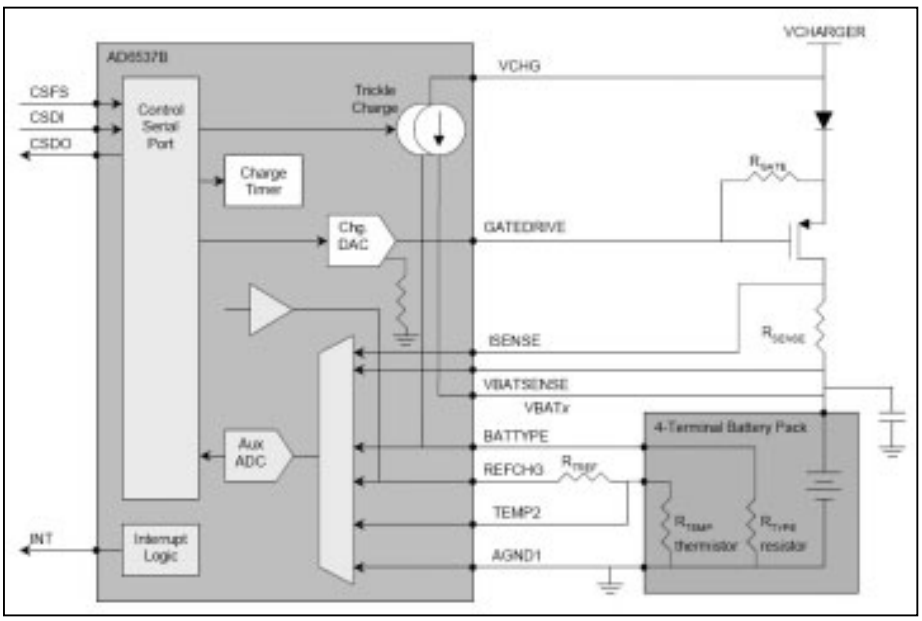



**Figure 3-17. AD6537B BATTERY CHARGING BLOCK**

# 3. TECHNICAL BRIEF

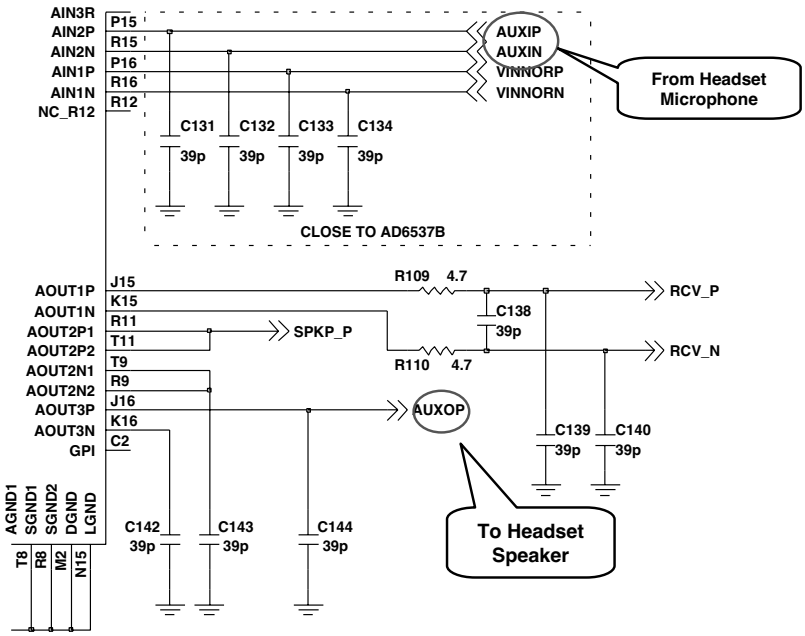



**Figure 3-18.KG245 HEADSET SPEAKER CIRCUIT (AD6537B)**

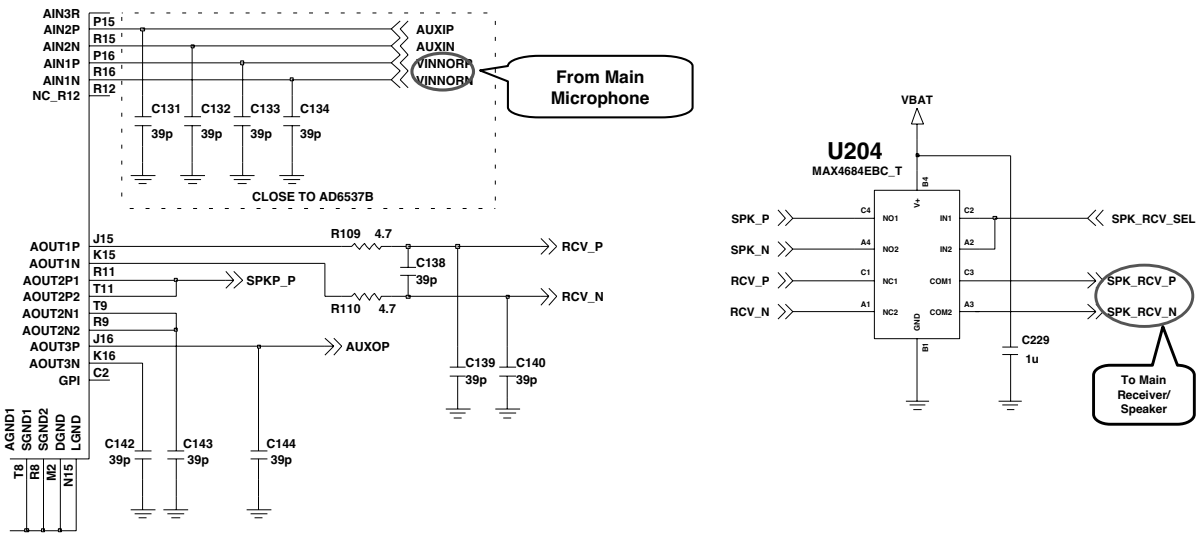
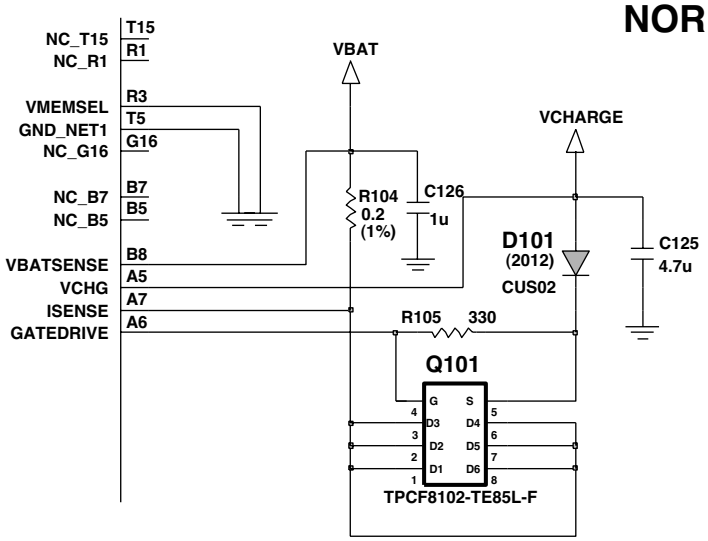



**Figure 3-19. KG245 HEADSET SPEAKER CIRCUIT (AD6537B)**

## NORMAL CHARGING




## Pre - CHARGING

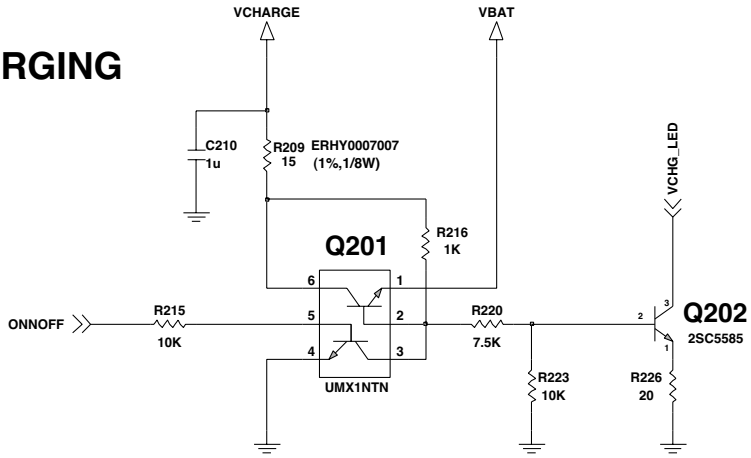



**Figure 3-20. CIRCUIT FOR BATTERY CHARGING AT AD6537B**

In order to reduce time for trickle charging, additional circuit(Pre-charge circuit) was included.
This circuit has supplied Max 160mA current into the battery additionally.
So call it, it reduce trickle charging time

## 3.7 LCD MODULE

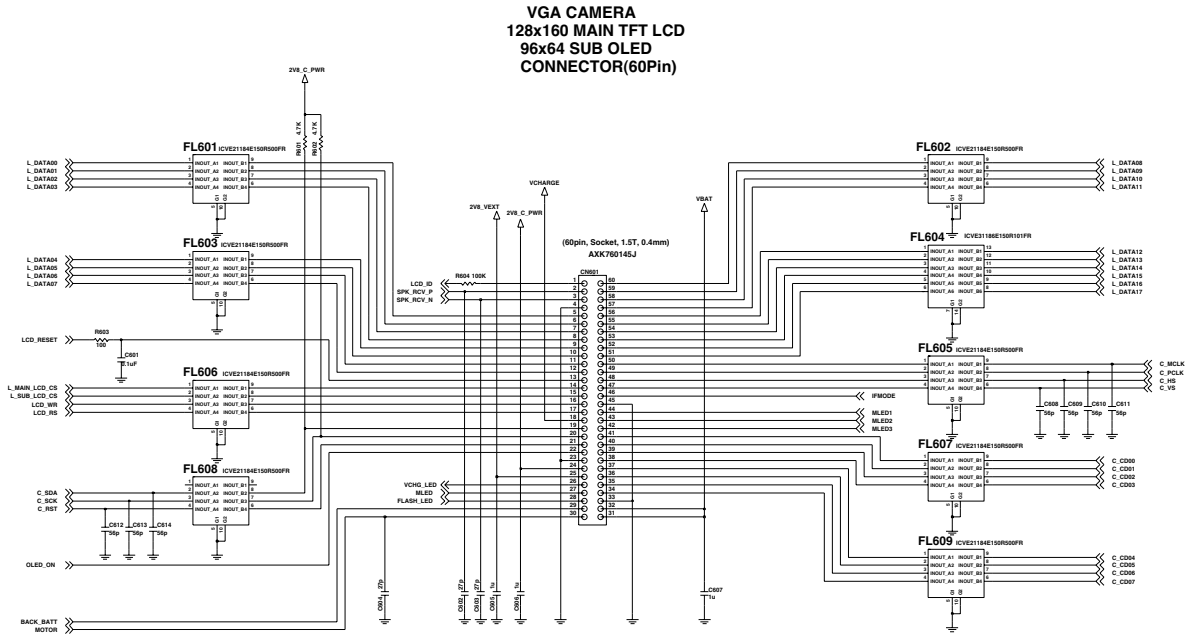



**Figure 3-21. LCD MODULE CIRCUIT**

Controlled by L_MAIN_LCD_CS, L_SUB_LCD_CS, LCD_RESET, LCD_RS, LCD_WR,LCD_RD,L_DATA[00:17] ports

- L_MAIN_LCD_CS : MAIN LCD driver chip enable. MAIN LCD driver IC has own CS pin
- LCD_RESET : This pin resets LCD module. This signal comes from DBB directly.
- LCD_RS: This pin determines whether the data to LCD module are display data or control data.
- L_WR : Write control Signal
- L_RD : Read control Signal. But this pin used only for debugging.
- L_DATA[00:17] : Parallel data lines.
- LCD_SIGNAL1 : LCD type selection signals
- For using 65K color, data buses should be 16 bits.

## 3.8 Camera

The CL765A contains various highly-advanced functions such as fully-hardwired JPEG codec, image scaler for Digital Zoom Function, MJPEG codec, high-speed Image data processing, OSD and so on. For the system level ingegration, the CL765A provides various off-chip interfaces including CMOS/CCD camera sensor interface, LCD interface, SD card interface and CCIR601/656 interface for external TV encoder interface.

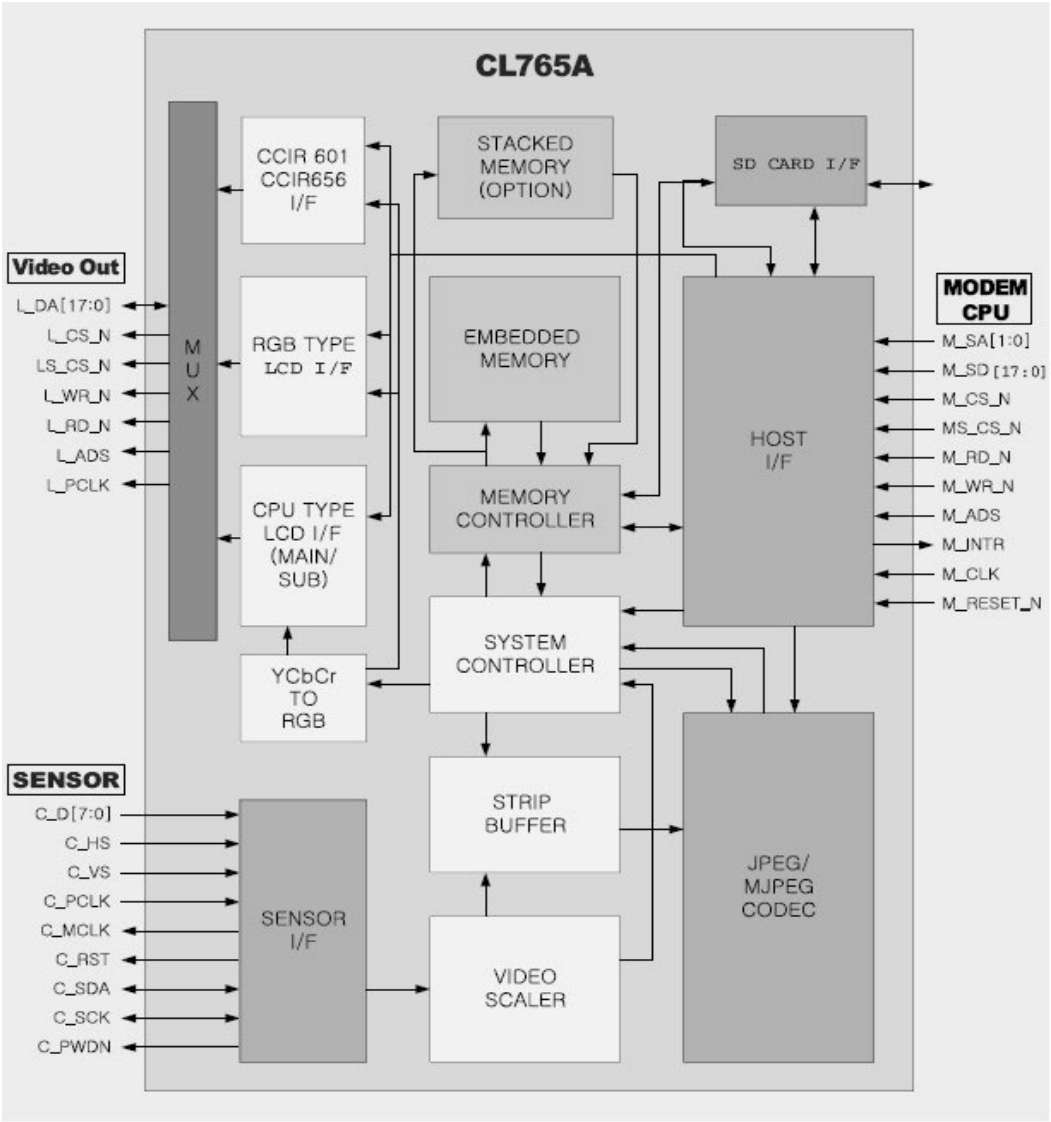



**Figure 3-22. CL765A BLOCK DIAGRAM**

# 3. TECHNICAL BRIEF

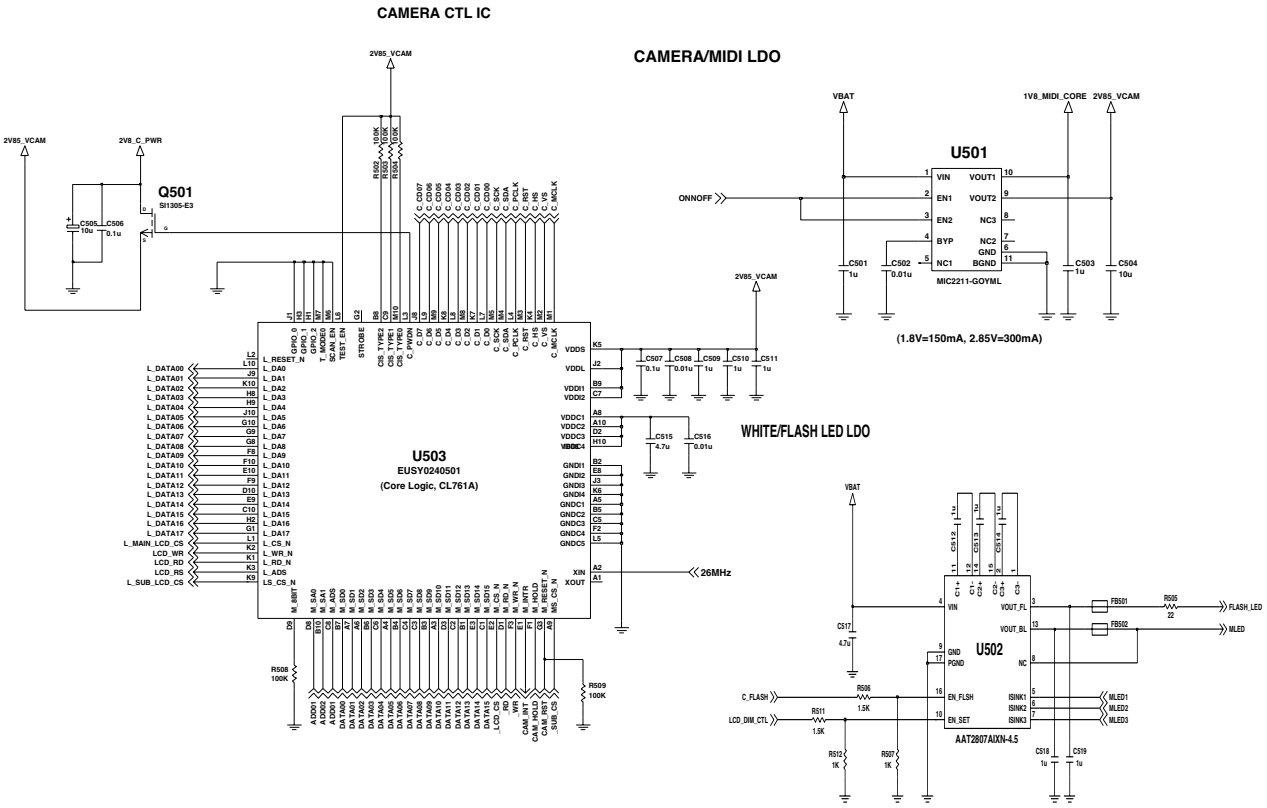



**Figure 3-23. CL761 CAMERA IC CIRCUIT**

A.Camera Interface : Allows you to use the built-in camera to take photos with the phone . The phone encodes up to 640 x 480 size with free size support.

B.U503 : Camera back-end IC. Camera signal is delivered from Camera Sensor to Camera IC(Q501).

C. Q501,U503,U502 : Regulator for U503 and Camera sensor.

## 3.9 Keypad Switch and Scanning

The key switches are metal domes, which make contact between two concentric pads on the keypad layer of the PCB when pressed. There are (Normal Key 24EA, Camera side key, Volume up down side key), connected in a matrix of 5 rows by 5 columns and additional GPIO 35 for KEY_ROW5, as shown in Figure 3-24, except for the power switch (KB1), which is connected independently. Functions, the row and column lines of the keypad are connected to ports of AD6527. The columns are outputs, while the rows are inputs and have pull-up resistors built in.

When a key is pressed, the corresponding row and column are connected together, causing the row input to go low and generate an interrupt. The columns/rows are then scanned by AD6527 to identify the pressed key.

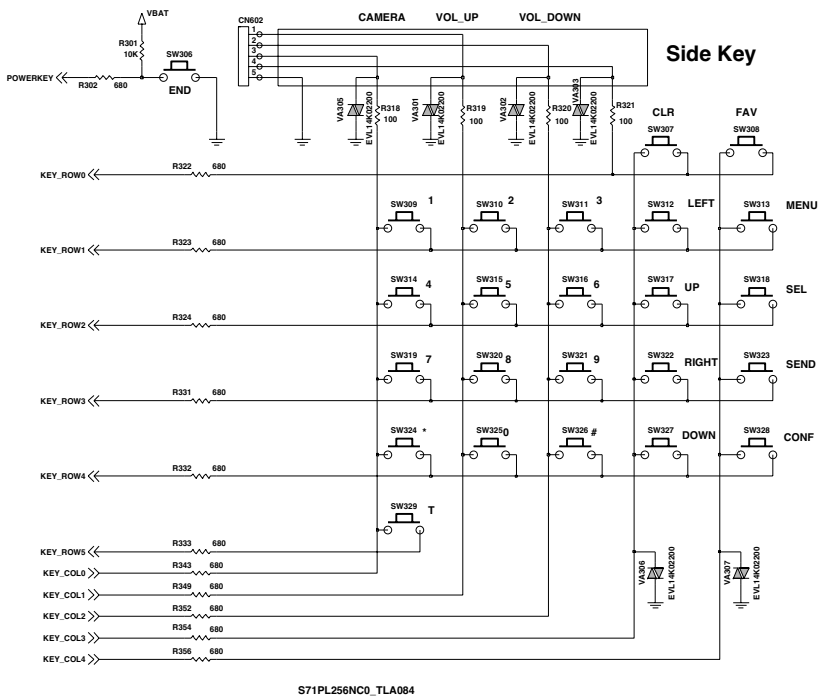



**Figure 3-24. Keypad Switches and Scanning**

## 3.10 Microphone

The microphone is placed to the front cover and contacted to main PCB. The audio signal is passed to AIN1P and AIN1N pins of AD6537B. The voltage supply VMIC is output from AD6537B, and is a biased voltage for the AIN1P. The AIN1P and AIN1N signals are then A/D converted by the voiceband ADC part of AD6537B.The digitized speech (PCM 8KHz ,16KHz) is then passed to the DSP section of AD6527 for processing (coding, interleaving etc).

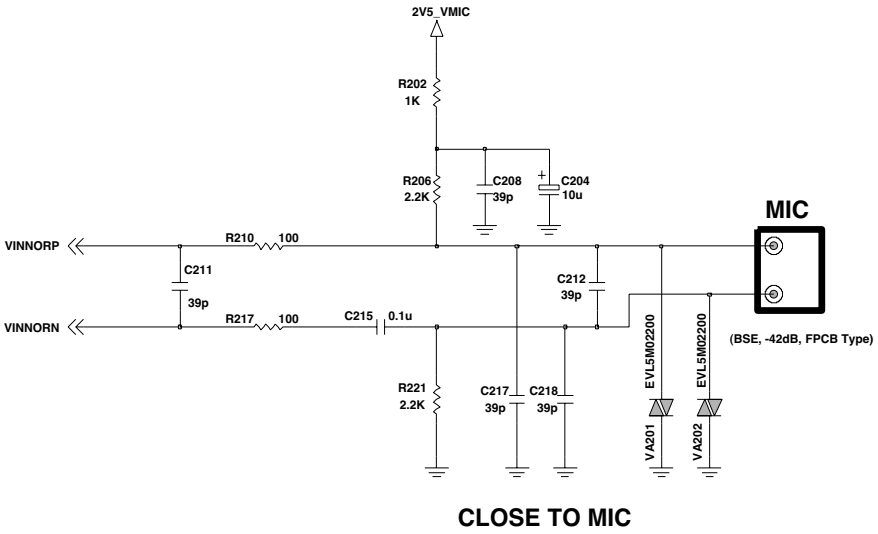



**Figure 3-25. Connection between Microphone and AD6537B**

## 3.11 Main Speaker

In the case of G692 , there are 3 different speakers. One is main speaker for the received voice, another are loud speaker for playback of ring tone , key tone and other MIDI sounds and the other is headset speaker. The main speaker is driven directly from AD6537B AOUT1P and AOUT1N pins and the gain is controlled by the PGA in an AD6537B. The receiver is placed in the folder cover and connected to AOUT1x terminal via FPCB.

## 3.12 Headset Interface

This phone chooses a 6 pin type headset which has 6 electrodes such as GND, AUXIP, AUXIN (this pin is floating), AUXOP, JACK_DETECT, HOOK_DETECT. This type supports mono sound.

**Switching from Receiver to Headset Jack**

If jack is inserted, JACK_DETECT goes from high to low.

Audio path is switched from receiver to earphone by JACK_DETECT interrupt.

**Switching from Headset Jack to Receiver**

If jack is removed, JACK_DETECT goes from low to high.

Audio path is switched from earphone to receiver by JACK_DETECT interrupt.

**Hook detection**

If hook-button is pressed, HOOK_DETECT is changed from high to low.

This is detected by AD6527(GPIO_36).

And then hook is detected.

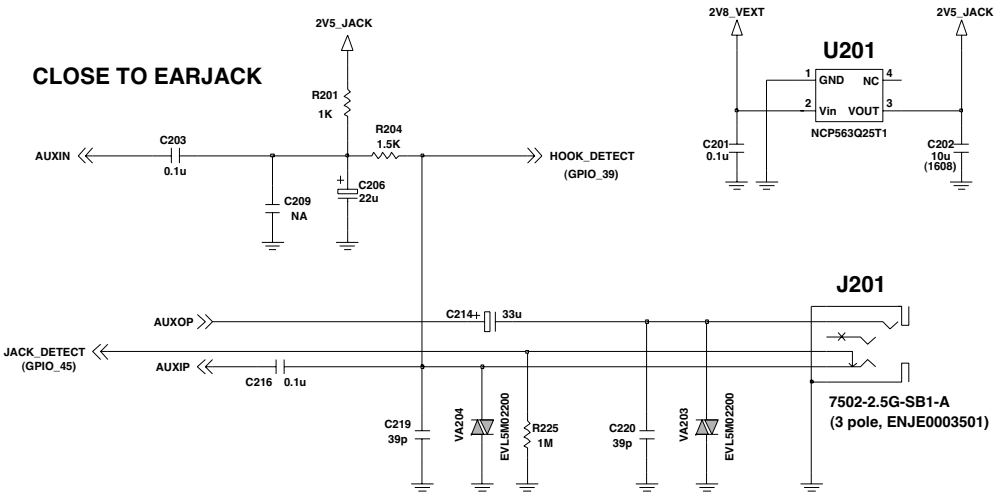



**Figure 3-26. HEADSET JACK INTERFACE**

## 3.13 Key Back-light Illumination

In key back-light illumination, there are 14 Blue LEDs in Main Board, which are driven by KEY_BACKLIGHT signal from AD6527.

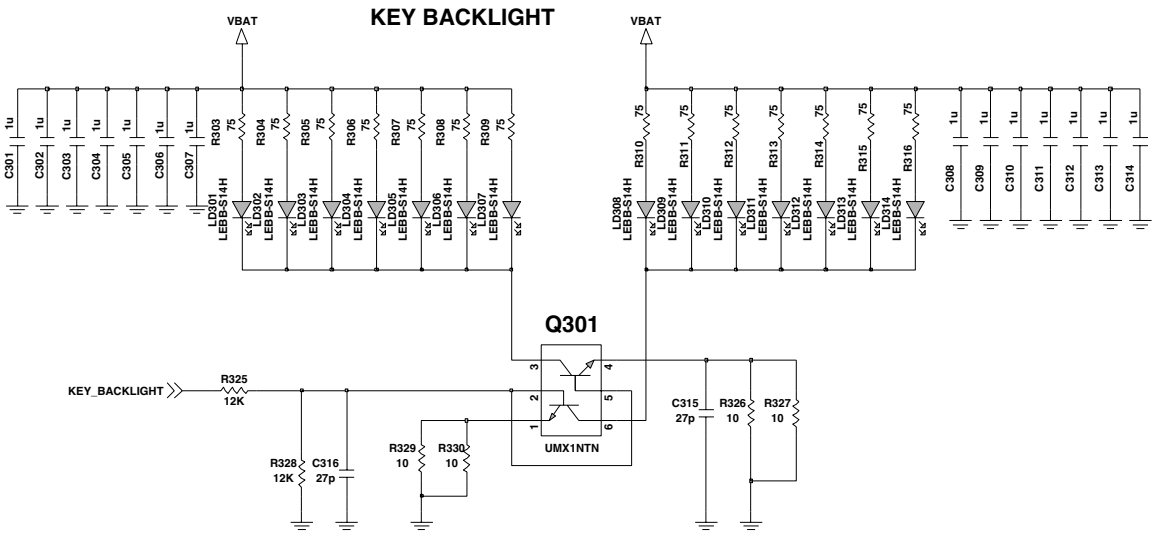



**Figure 3-27. KEY BACK-LIGHT ILLUMINTION**

## 3.14 VIBRATOR

The vibrator is placed in the folder cover and contacted to LCD MODULE. The vibrator is driven from VIBRATOR (GPIO_3) of AD6527.

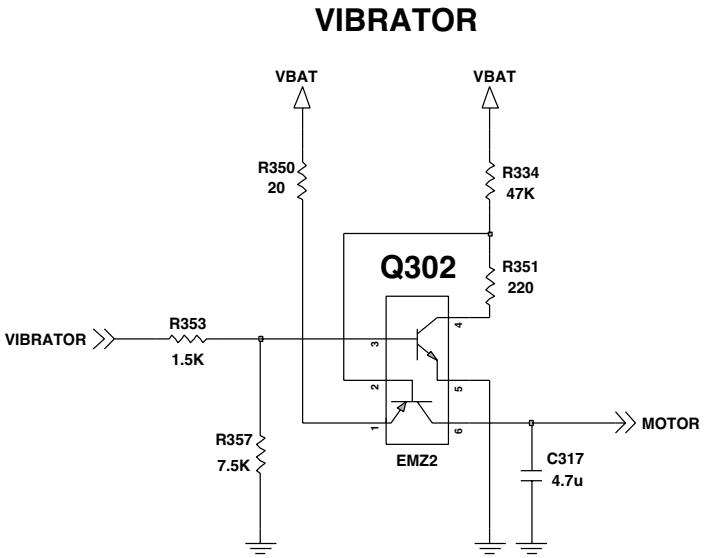



**Figure 3-28. MOTOR**

## 3.15 Bluetooth Section Description (M201)

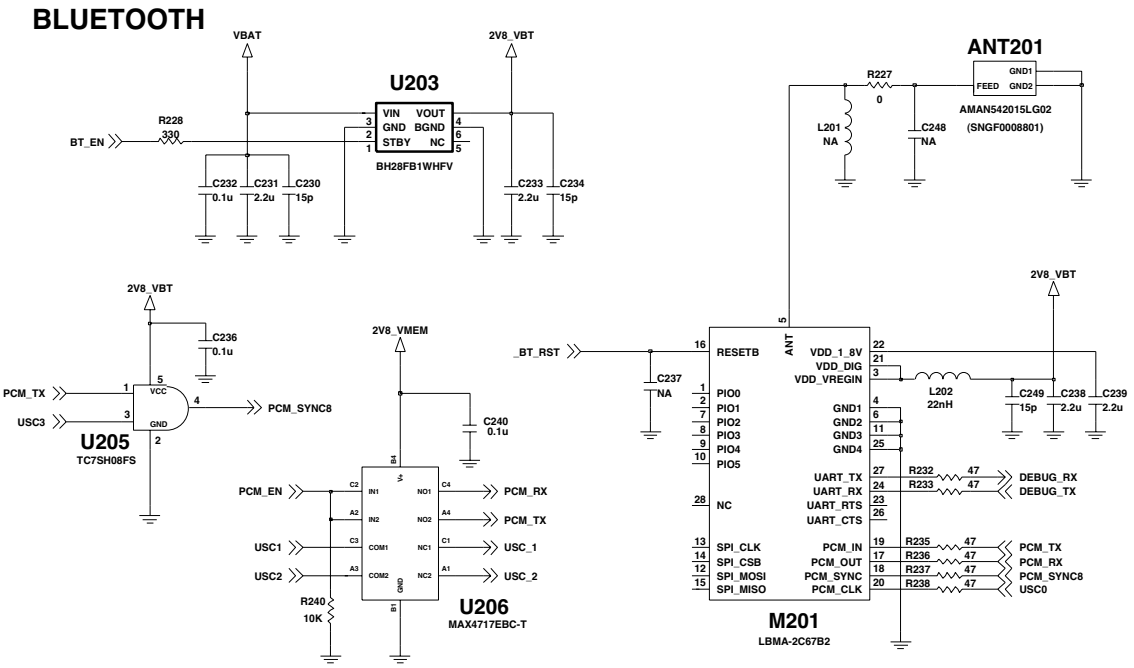



**Figure 3-29. BLUETOOTH CIRCUIT**

1) U203(BH28FB1WHFV) : Provide power for bluetooth block
2) U205(TC7SH08FS) : PCM Sync Clock rate converter for bluetooth clock(8kHZ)
3) U206(MAX4717EBC-T) : Analog switch for bluetooth block
4) M201(LBMA-2C67B2) : Bluetooth module

### 3.16.1 Bluetooth Circuit Description (M201)

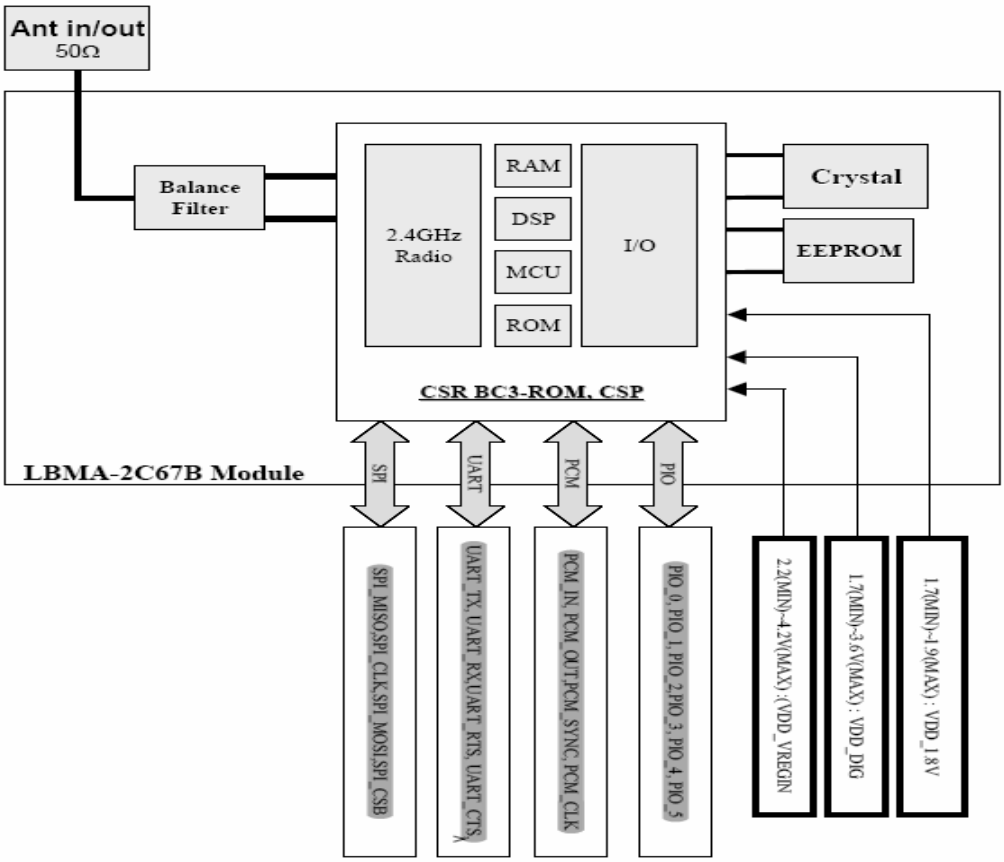



**Figure 3-30. BLUETOOTH INTERFACE**

1. Bluetooth Module Features
- Output power(Class2): 1.0 dBm Typ.
- Receiver Sensitivity: -83 dBM Max.
- Dimensions: 6.9 * 7.9 * 1.5 (unit: mm)
- Wide operating temperature range(Target): -40 to85C (Storage: -40 to 100C)
- D.C Supply voltage range: 1.8V or 3.0V(Nominal)
- Interfaces: UART and SPI for data and PCM for voice
- Stack layer: HCI or RFCOMM
- Compatibility with Bluetooth Specification 1.2

# 4. TROUBLE SHOOTING

## 4.1 RF Component

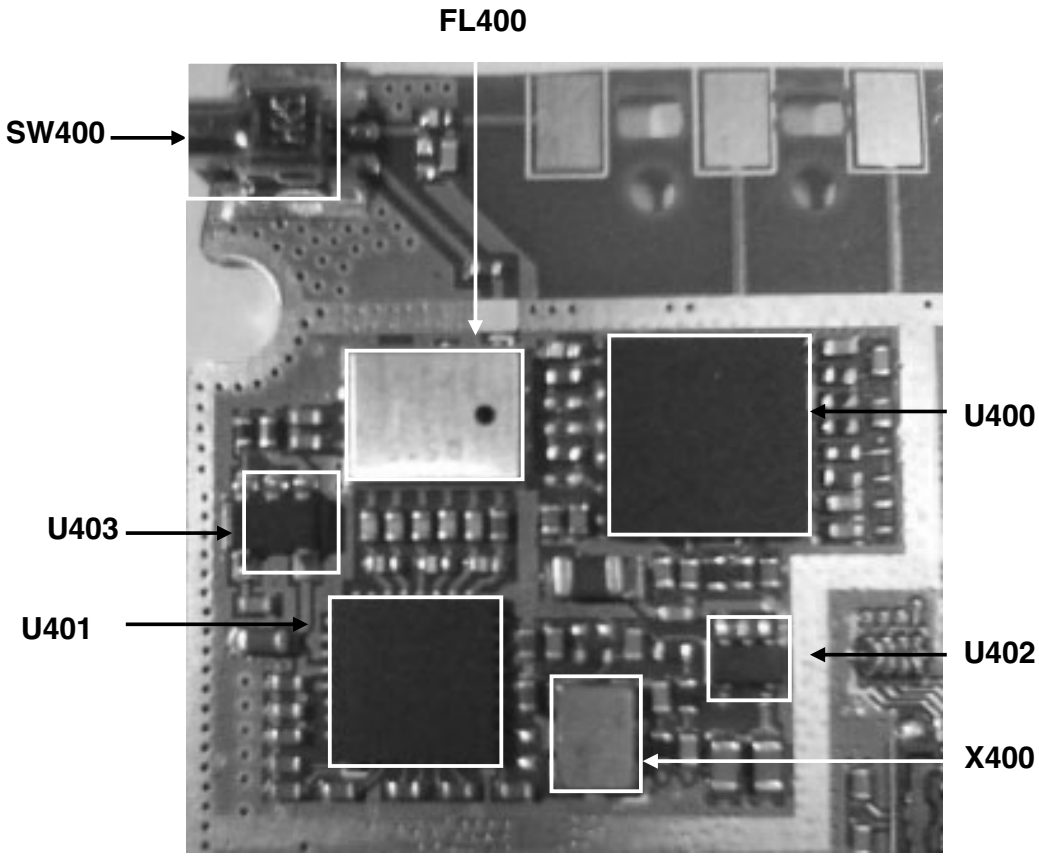
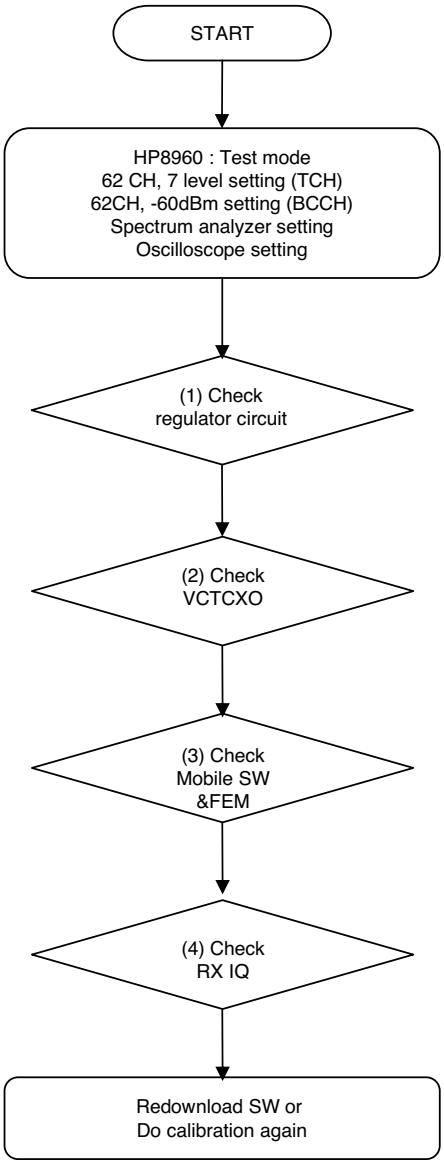



**Figure 4-1. RF Component**

| | |
|---|---|
| **U400** | Power Amp Module(SKY77328) |
| **U401** | RF Main Chip(SI4210) |
| **U402** | Inerter |
| **U403** | 2.85V Regulator |
| **X400** | VVCXO,26MHz Clock |
| **FI400** | FEM |
| **Sw400** | Mobile Switch |

## 4.2 RX Trouble

### CHECKING FLOW



### (1) Checking Regulator Circuit

## TEST POINT

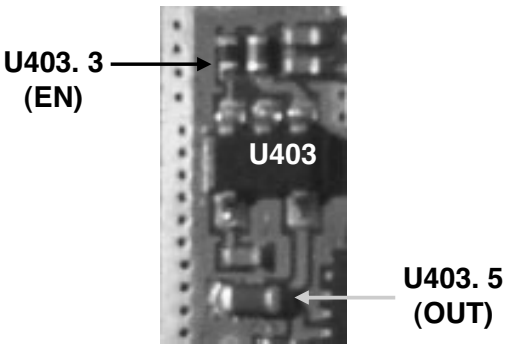



**Figure 4-2 (a). Regulator Circuit**

## CIRCUIT

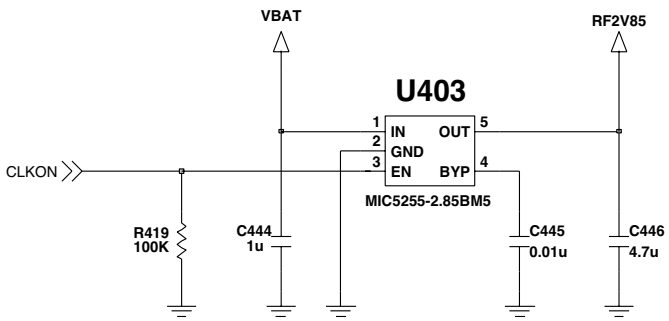
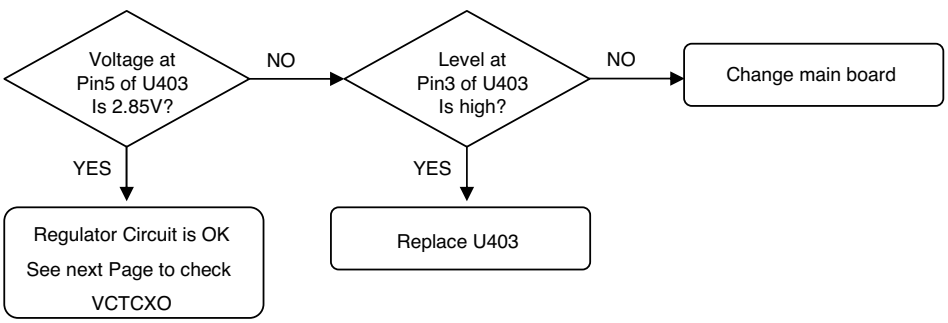


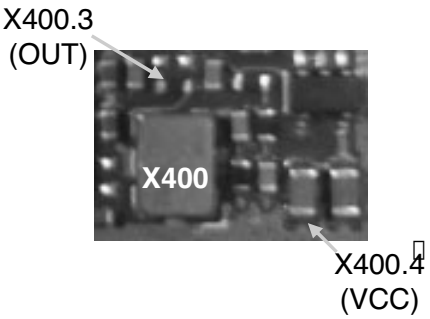

**Figure 4-2 (b). Regulator Circuit**

## CHECKING FLOW



### (2) Checking VVCXO Circuit

**TEST POINT**




**CHECKING FLOW**

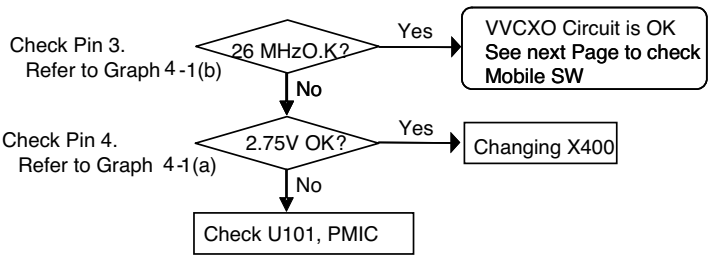



**Figure 4-3 (a). VVTXO Circuit**

**CIRCUIT**

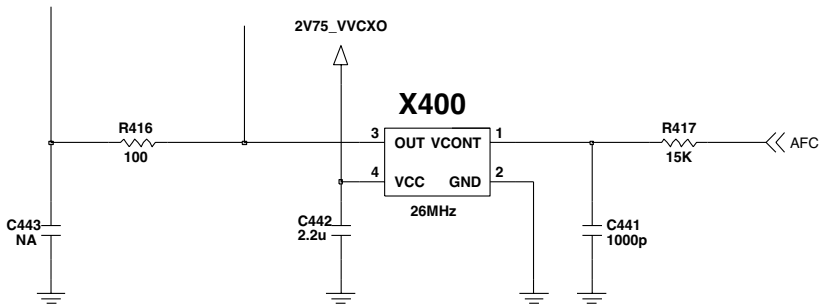
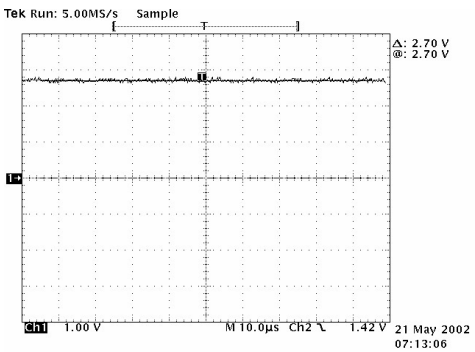
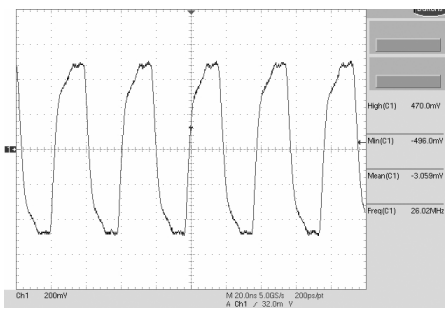



**Figure 4-3 (a). VVTXO Circuit**

**WAVEFORM**




**Graph 1(a)**



**Graph 1(b)**

### (3) Checking Mobile SW & FEM

**TEST POINT**

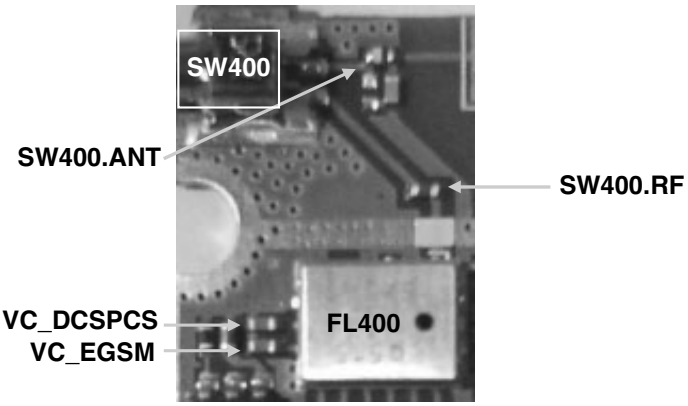



**Figure 4-4(a) Mobile SW & FEM Circuit**

**CIRCUIT**

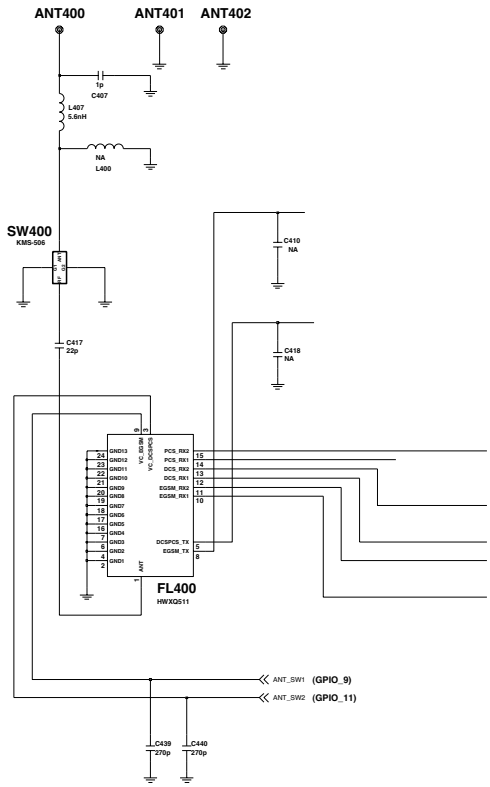
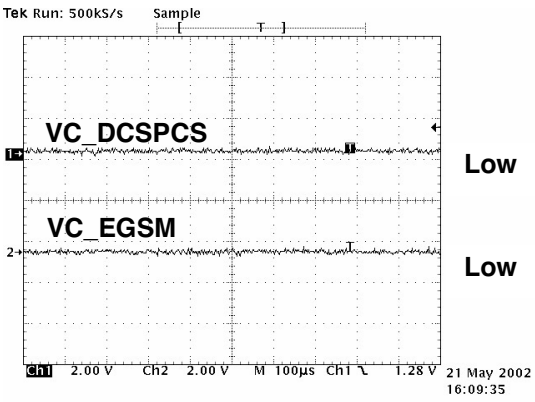



**Figure 4-4 (b). Mobile SW & FEM Circuit**

**WAVEFORM**

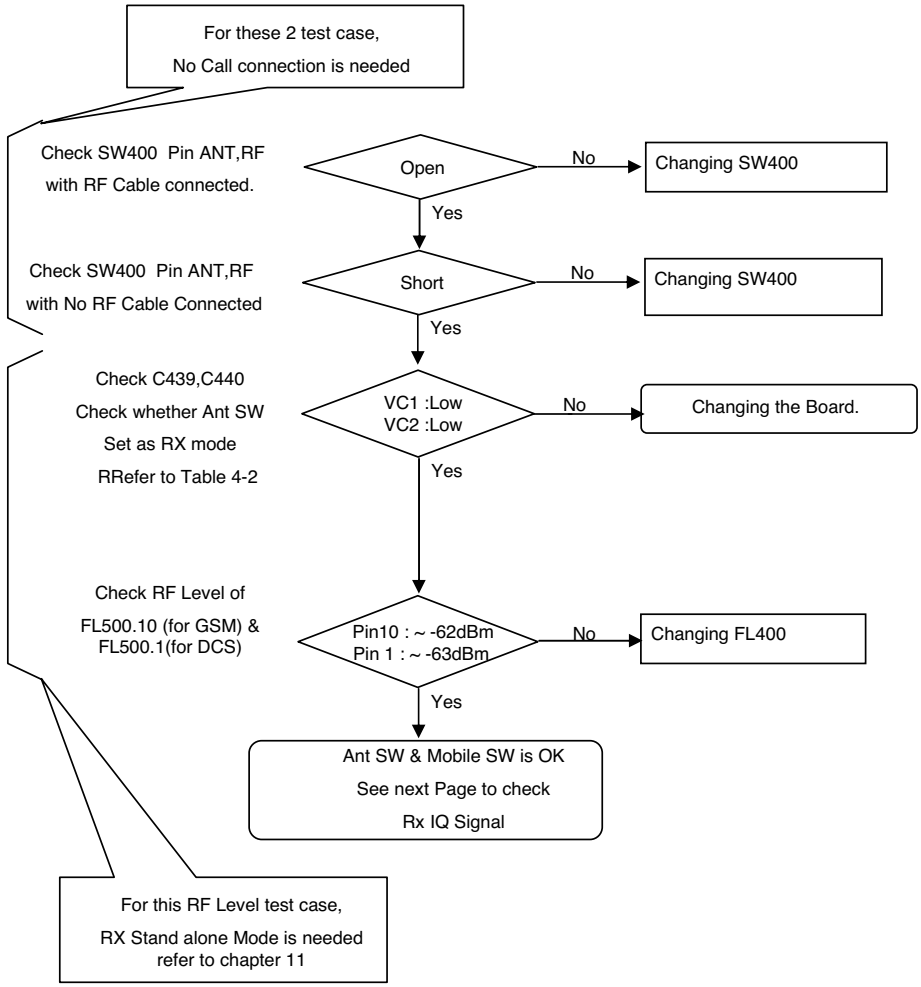



**ANT SW Control GSM& DCS RX Mode**
**Graph 2**

| | ANT_SW1 | ANT_SW2 |
|---|---|---|
| GSM_TX | High | Low |
| DCS_TX | Low | High |
| RX | Low | Low |

**Table 1**

## CHECKING FLOW




| | ANT_SW1 | ANT_SW2 |
|---|---|---|
| GSM_TX | High | Low |
| DCS_TX | Low | High |
| RX | Low | Low |

**Table 4-2**

### (4) Checking RX IQ

**TEST POINT**

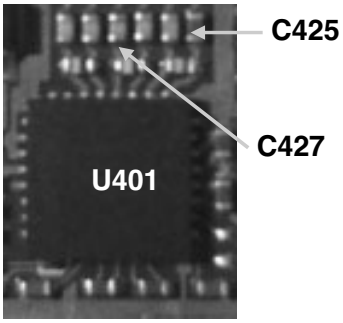
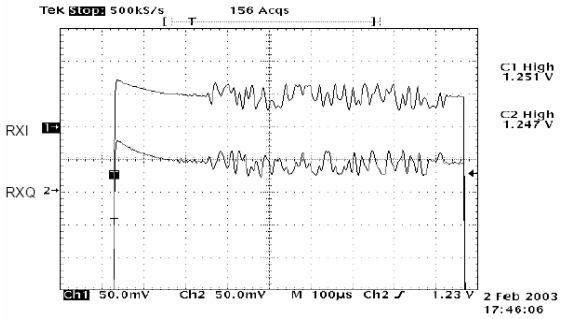



Figure 4-5 (a). RX IQ Circuit

**WAVEFORM**




Graph 3

**CIRCUIT**

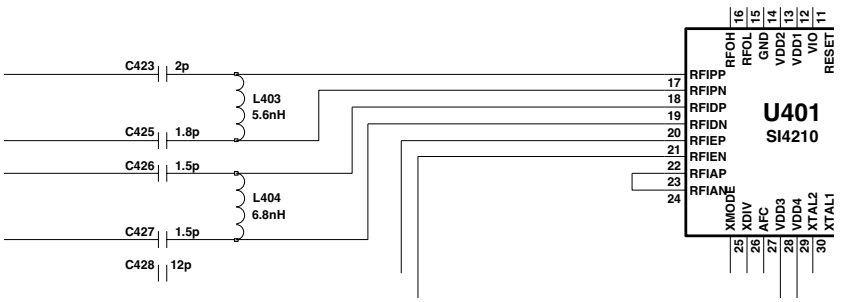
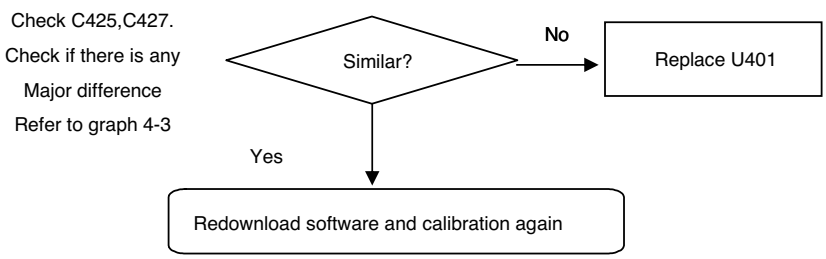


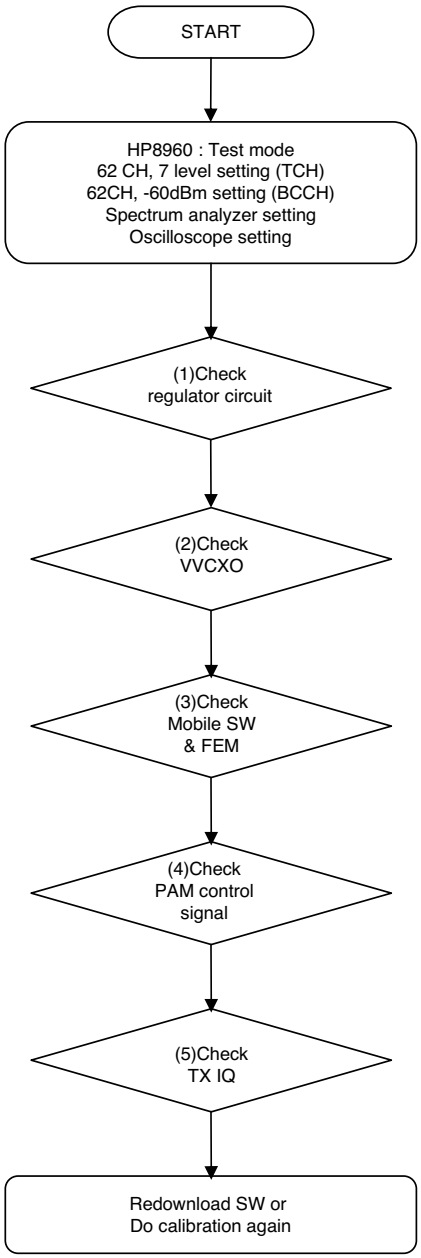

Figure 4-5 (b). RX IQ Circuit

**CHECKING FLOW**



## 4.3 TX Trouble

### CHECKING FLOW



### (1) Checking Regulator Circuit

**TEST POINT**

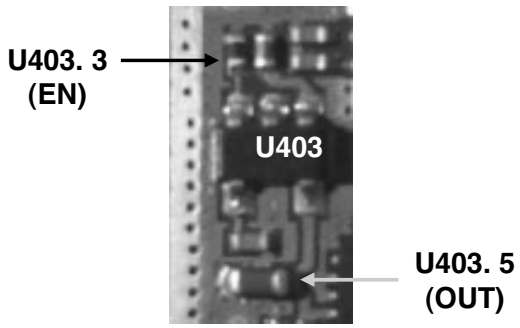



**Figure 4-6 (a). Regulator Circuit**

**CIRCUIT**

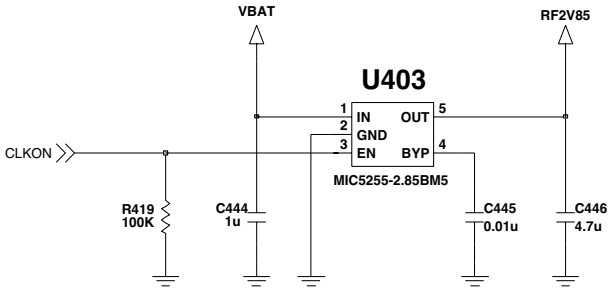
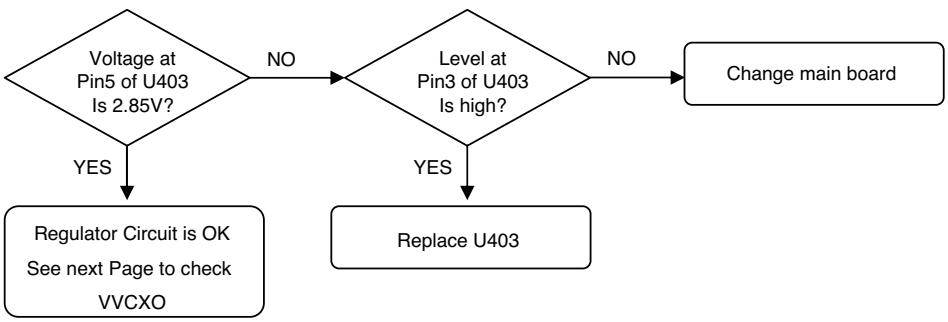


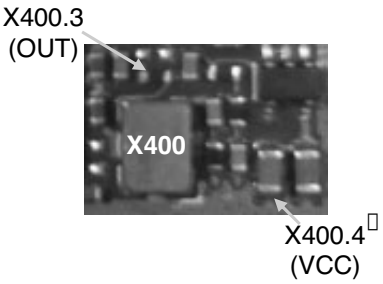

**Figure 4-6 (b). Regulator Circuit**

**CIRCUIT**



### (2) Checking VVCXO Circuit

**TEST POINT**




**CHECKING FLOW**

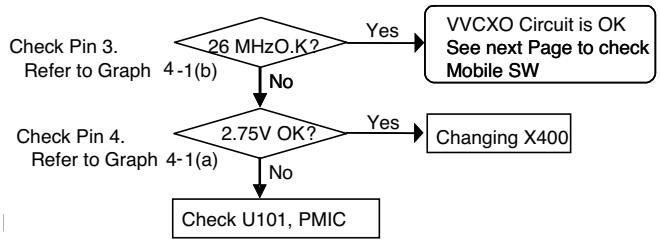



**Figure 4-7 (a). VVCXO Circuit**

**CIRCUIT**

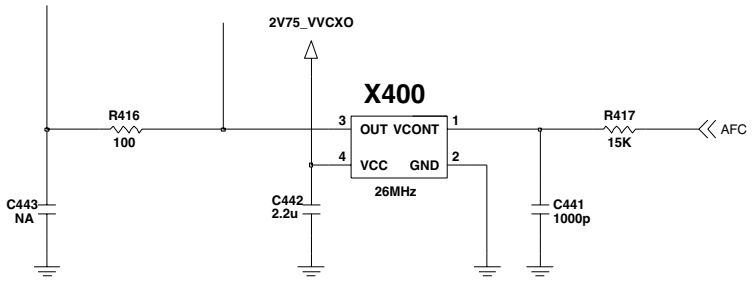
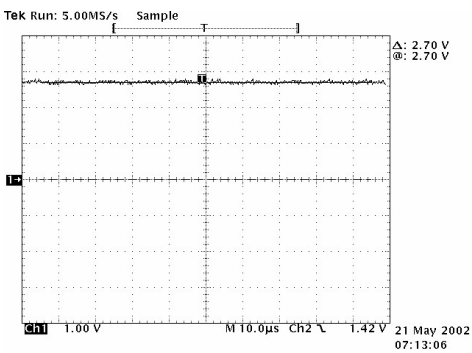
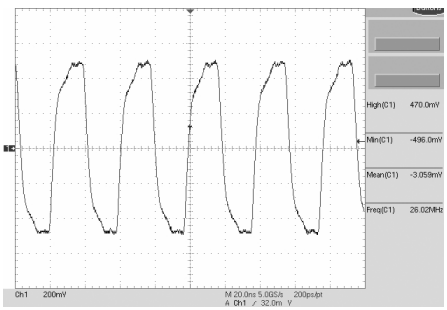



**Figure 4-7 (b). VVCXO Circuit**

**WAVEFORM**




**Graph 4(a)**



**Graph 4(a)**

### (3) Checking Mobile SW & FEM

**TEST POINT**

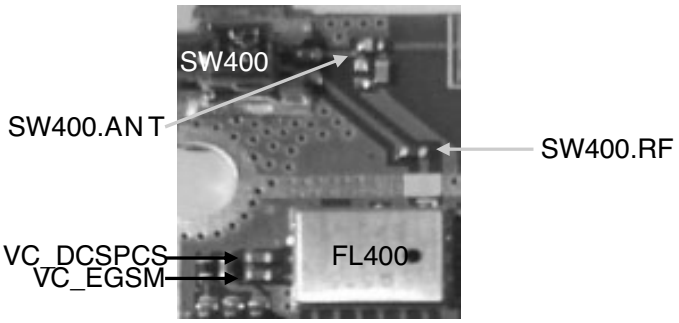
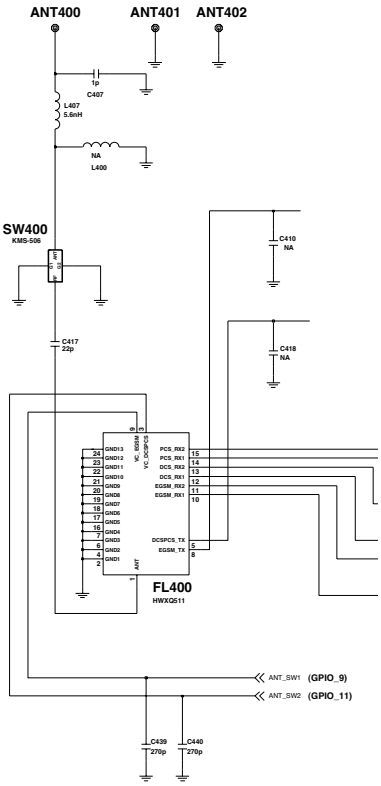
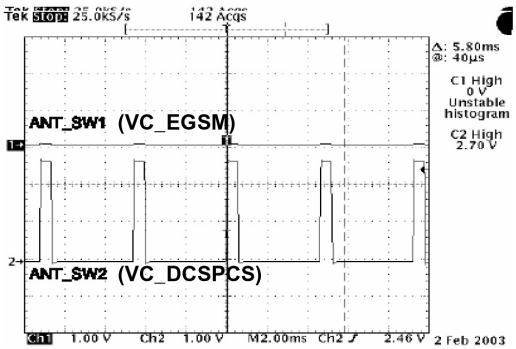



**Figure 4-8 (a). SW & FEM Circuit**

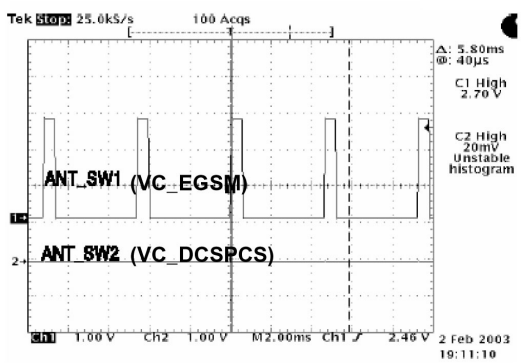
**CIRCUIT**




**WAVEFORM**

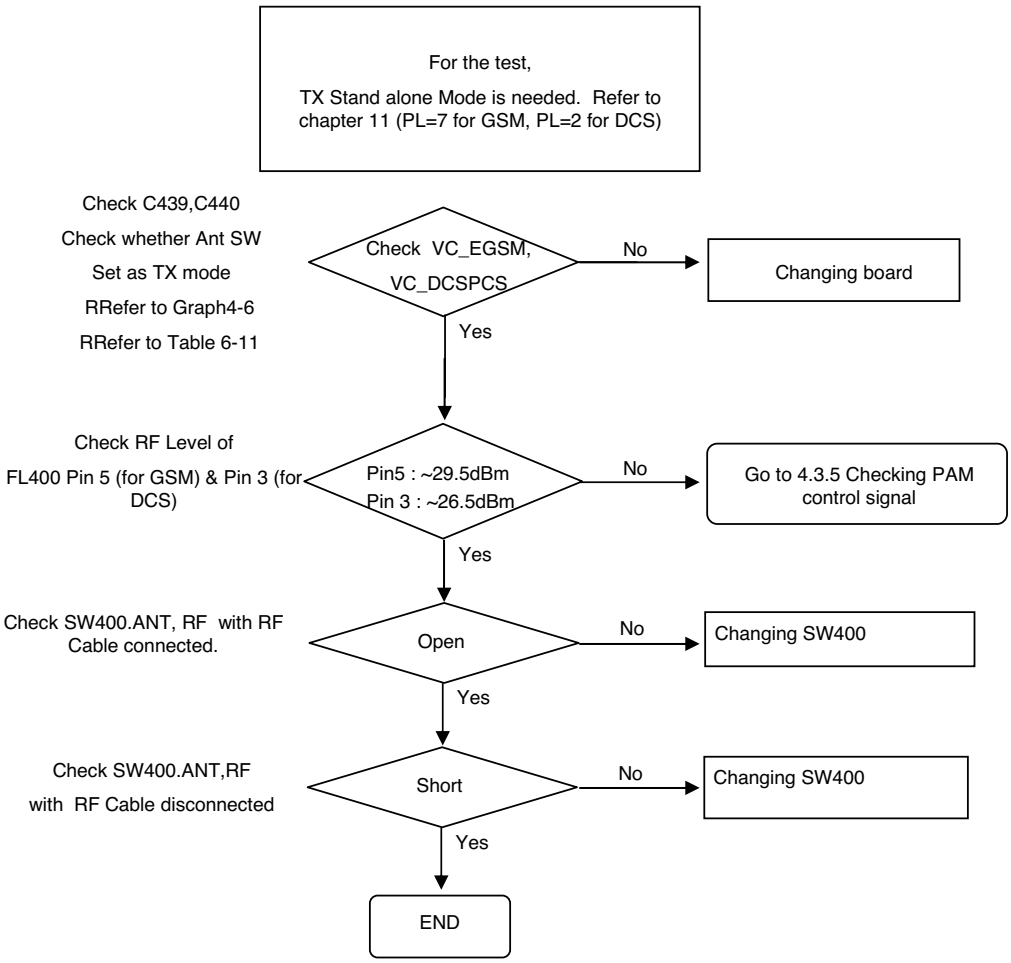



**Graph 5(a) GSM Tx mode**




**Graph 5(b) DCS,PCS Tx mode**

## CHECKING FLOW




| ANT SW | VC_EGSM | VC_CDSPCS |
|---|---|---|
| DCS TX | 0 | 1 |
| EGSM TX | 1 | 0 |
| EGSM, DCS RX | 0 | 0 |

**Table 4-3**

### (4) Checking PAM Control Signal

**TEST POINT**

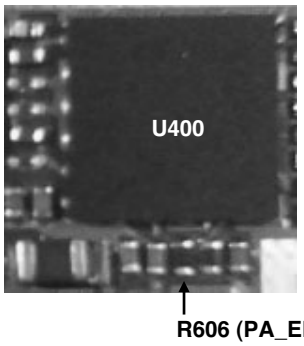
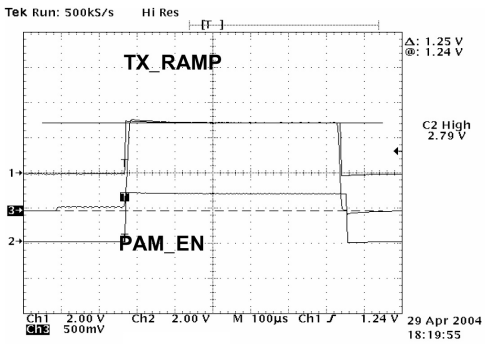



Figure 4-9 (a). PAM Control

**WAVEFORM**




Graph 6

**CIRCUIT**

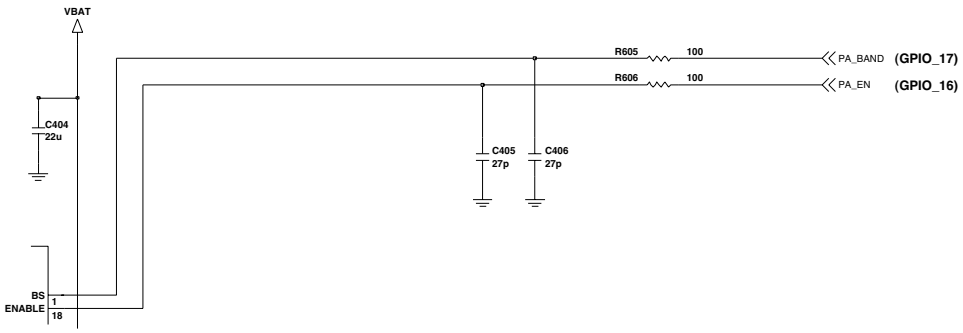
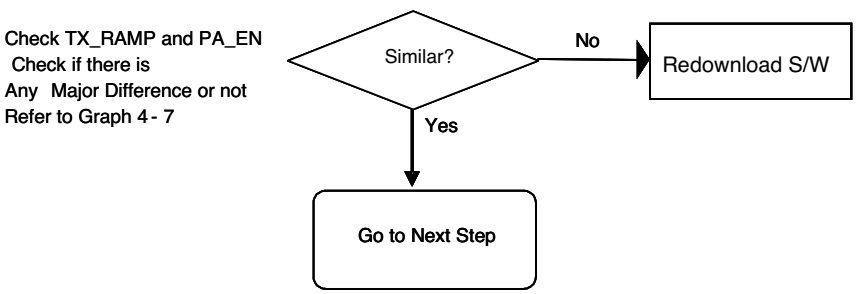



Figure 4-9 (b). PAM Control

**CHECKING FLOW**



### (5) Checking TX IQ

**TEST POINT**

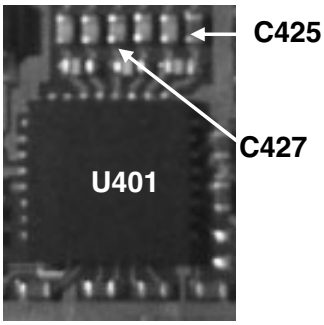
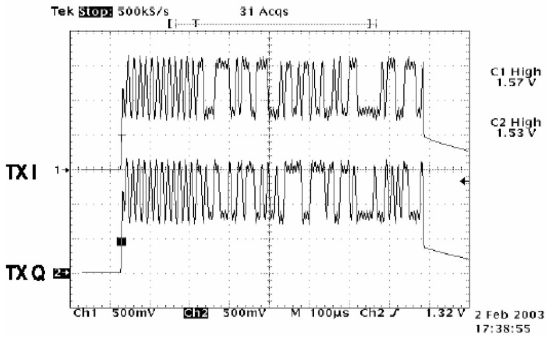



**Figure 4-10 (a). TX IQ**

**WAVEFORM**




**Graph 7**

**CIRCUIT**

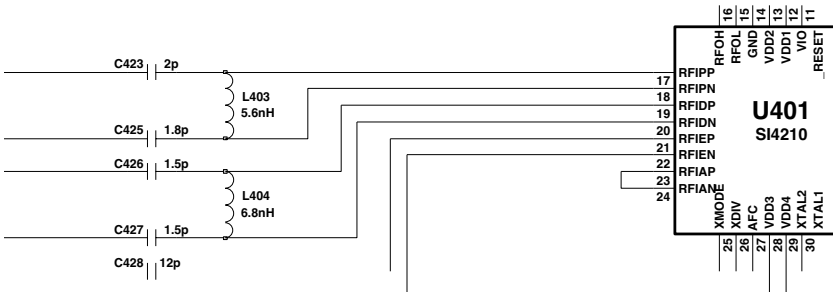
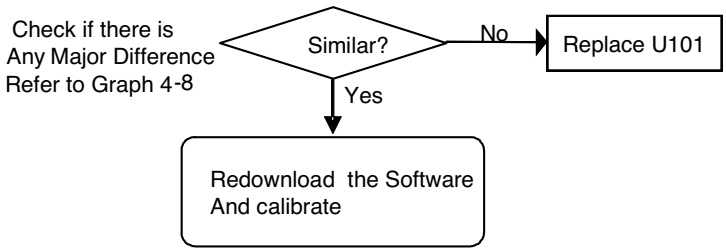



**Figure 4-10 (b). TX IQ**

**CHECKING FLOW**



## 4.4 Power On Trouble

### TEST POINT

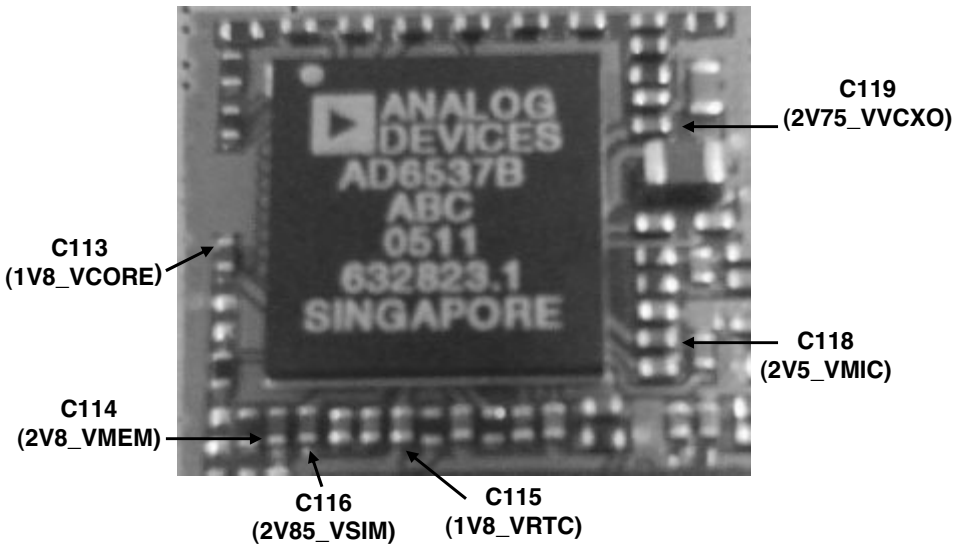



**Figure 4-11(a). Power On Trouble**

### CIRCUIT

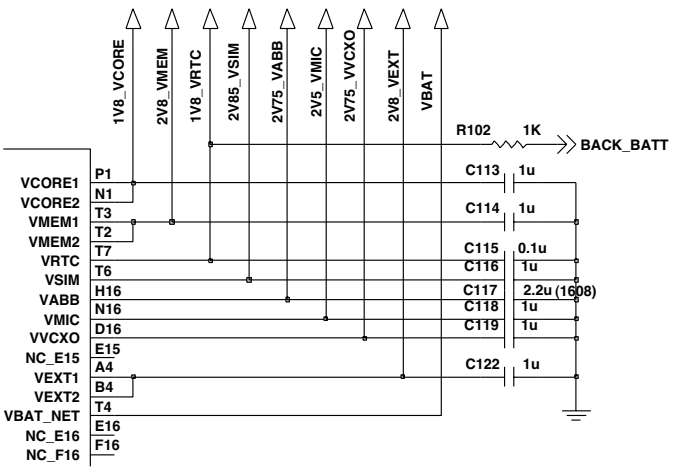
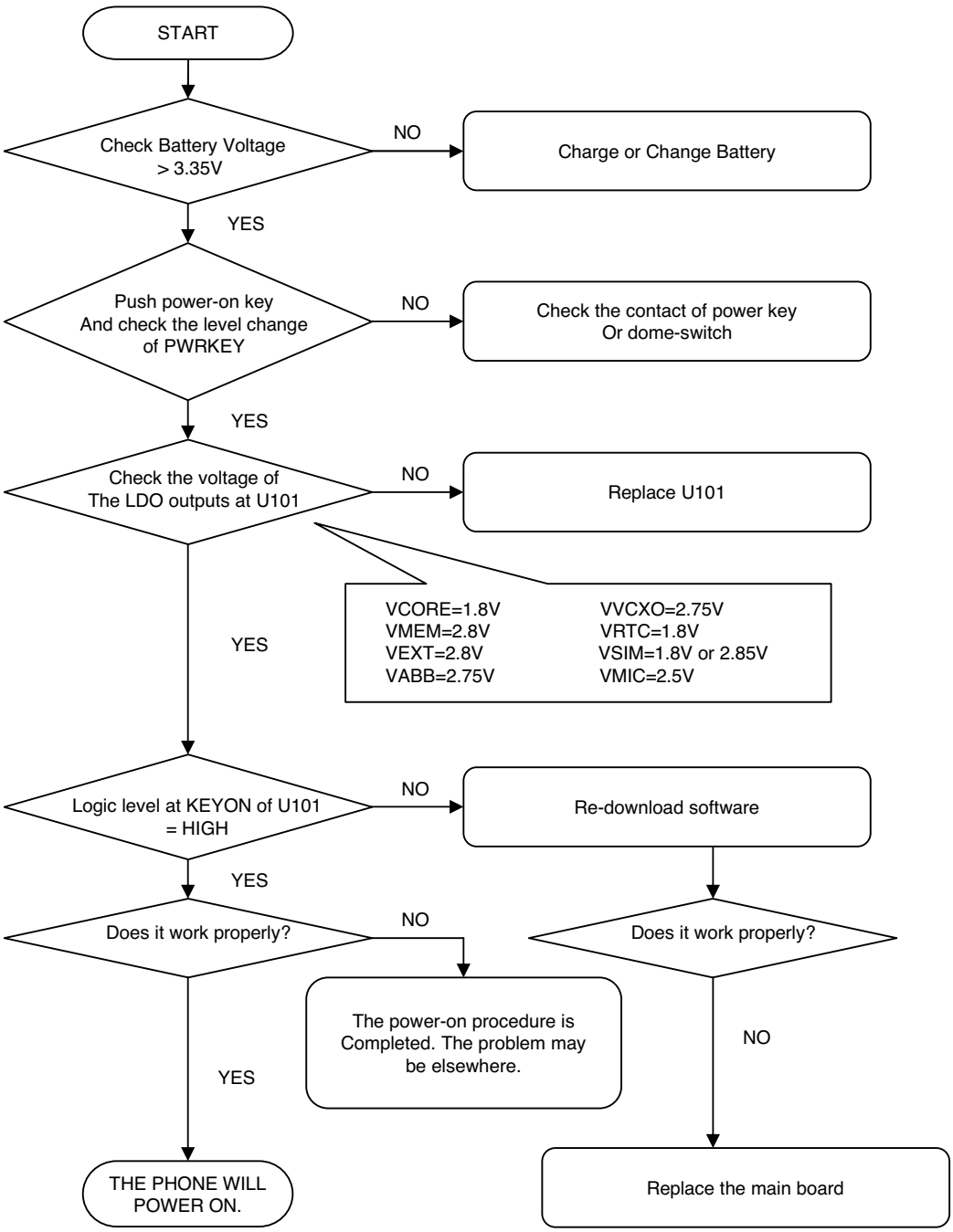



**Figure 4-11(b). Power On Trouble**

## CHECKING FLOW



## 4.5 Bluetooth Section Trouble Shooting

### TEST POINT

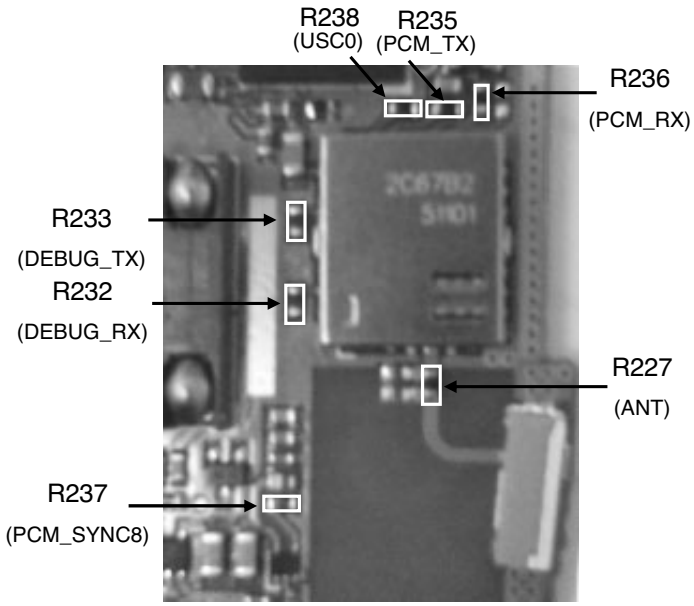



**Figure 4-12(a). Bluetooth Section Trouble Shooting**

### CIRCUIT

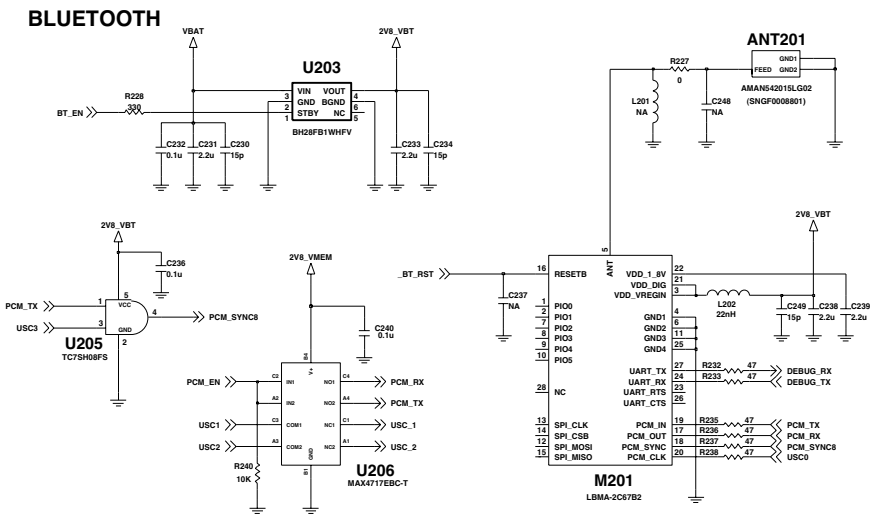



**Figure 4-12(b). Bluetooth Section Trouble Shooting**

## Checking flow

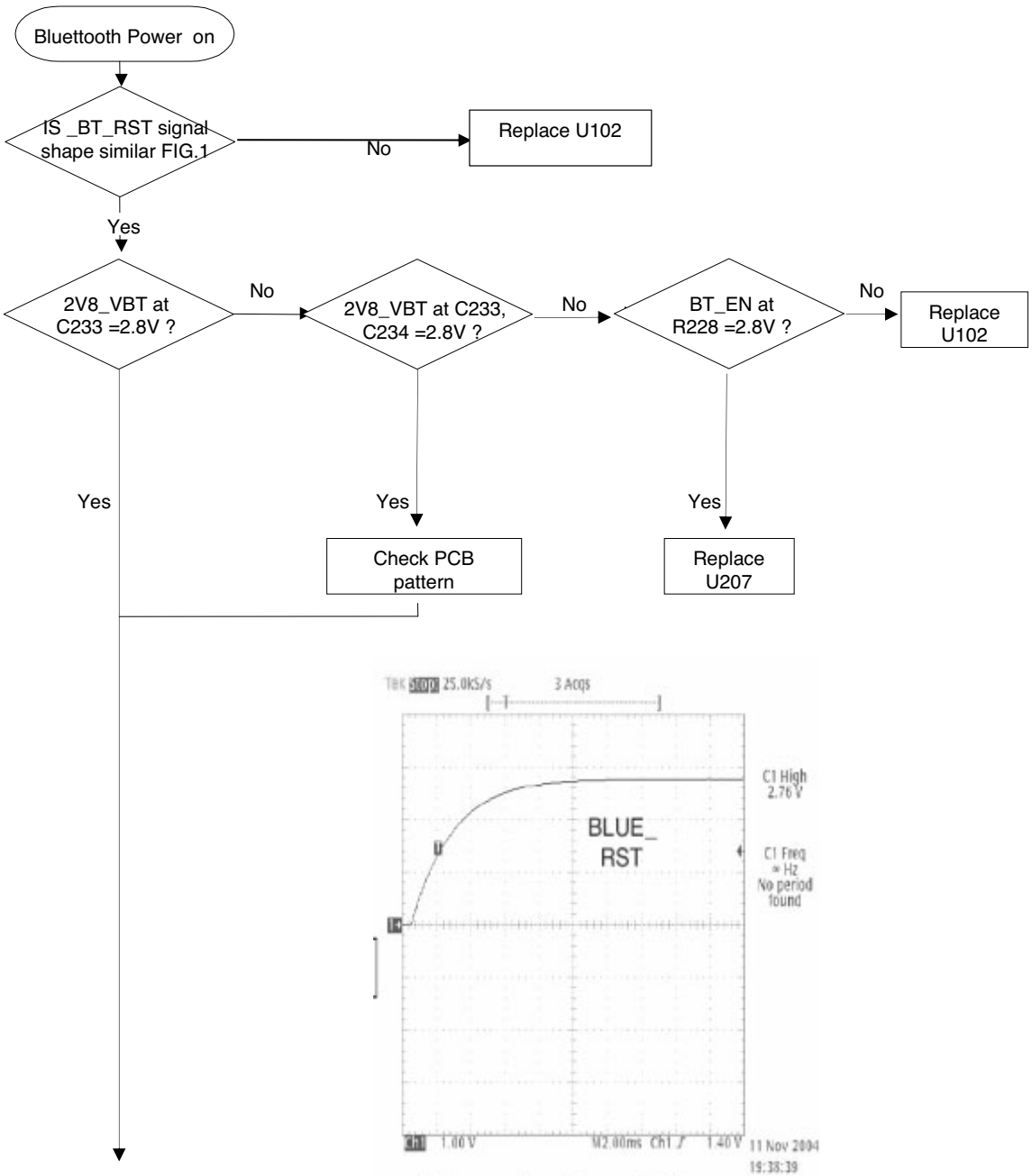






Figure 1_ Blue_RST

# 4. TROUBLE SHOOTING

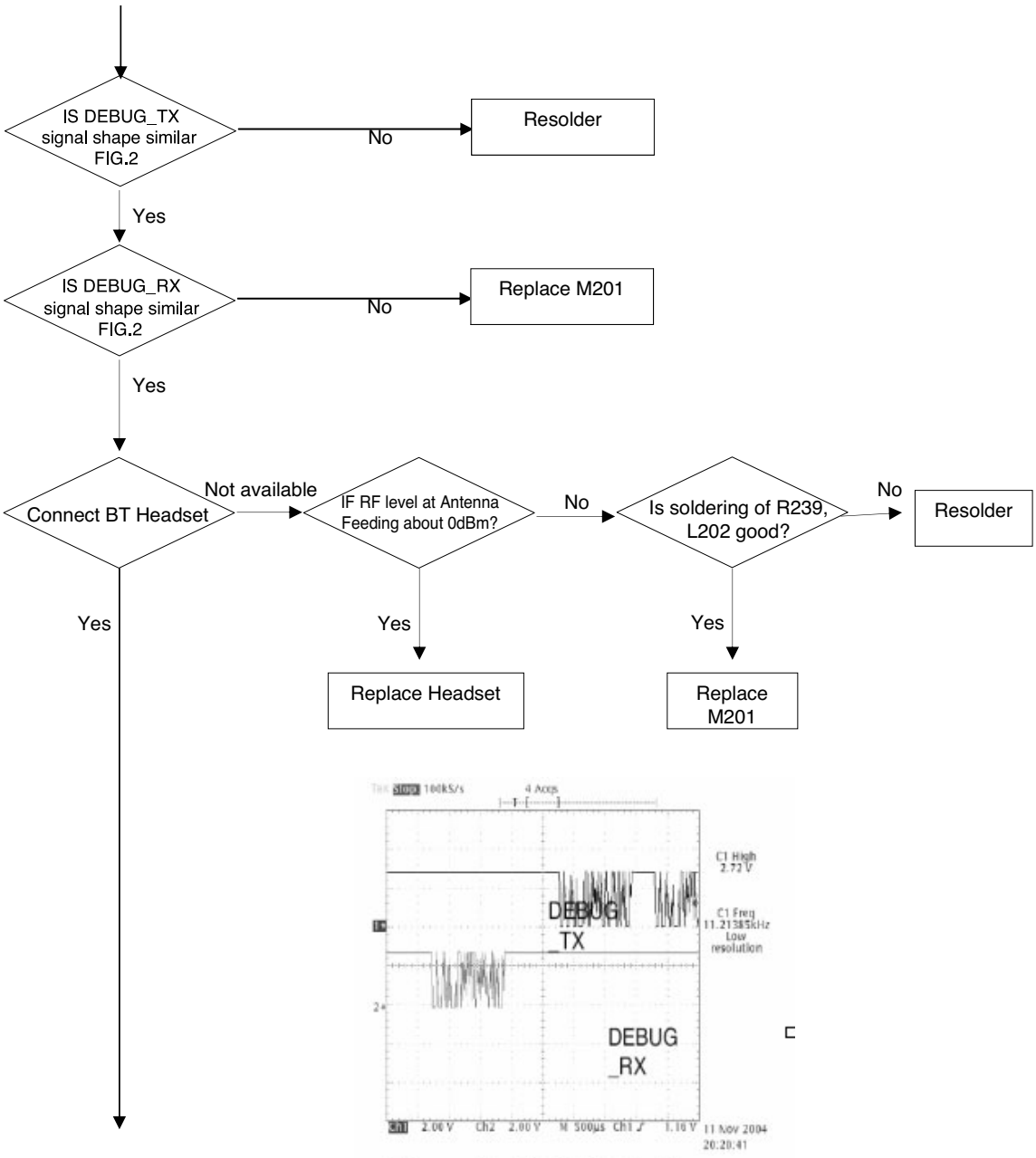
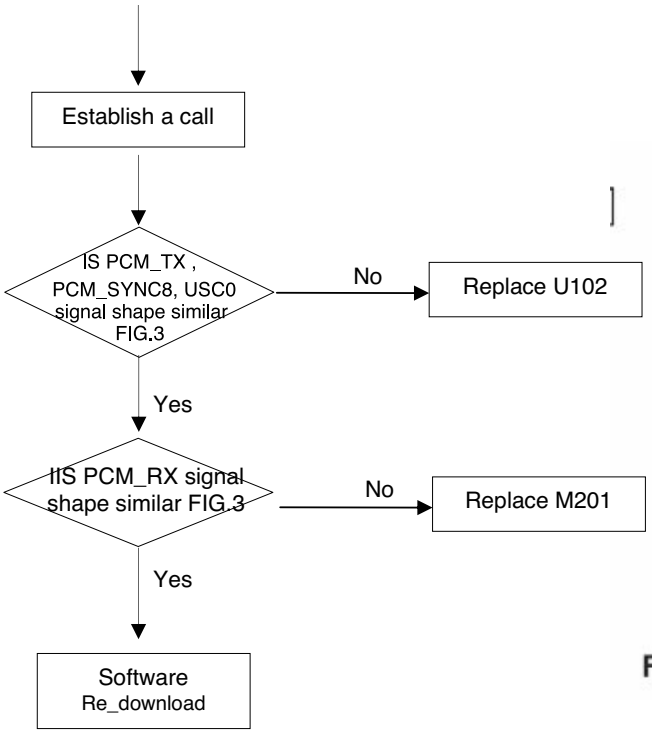






Figure 2_ DEBUG_Tx, Rx



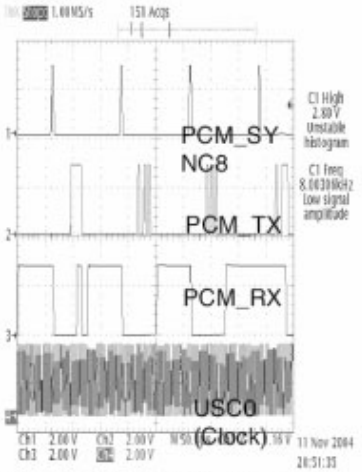




Figure 3_ PCM_SYNCS, Tx, Rx, USC0

## 4.6 Charging Trouble

### CIRCUIT DIAGRAM

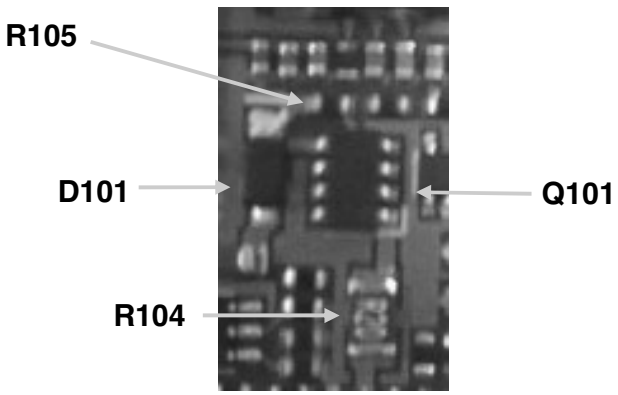



**Figure 4-13(a). Charging Trouble**

### CIRCUIT

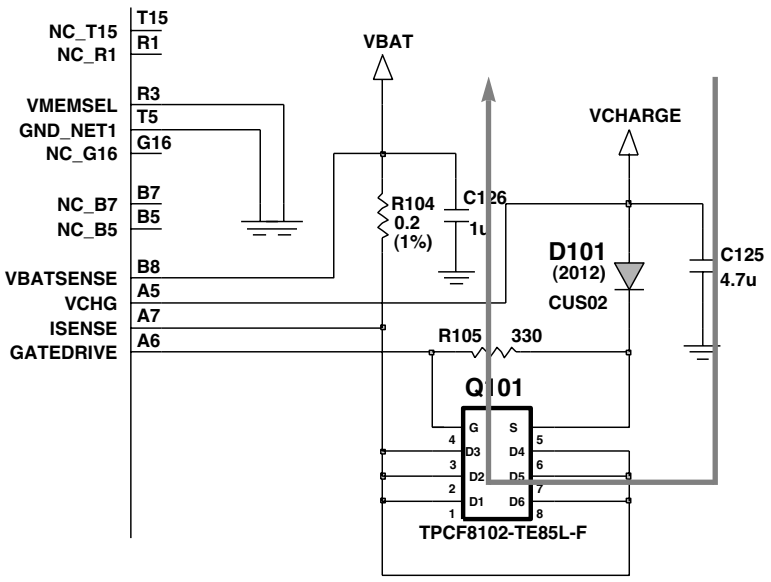
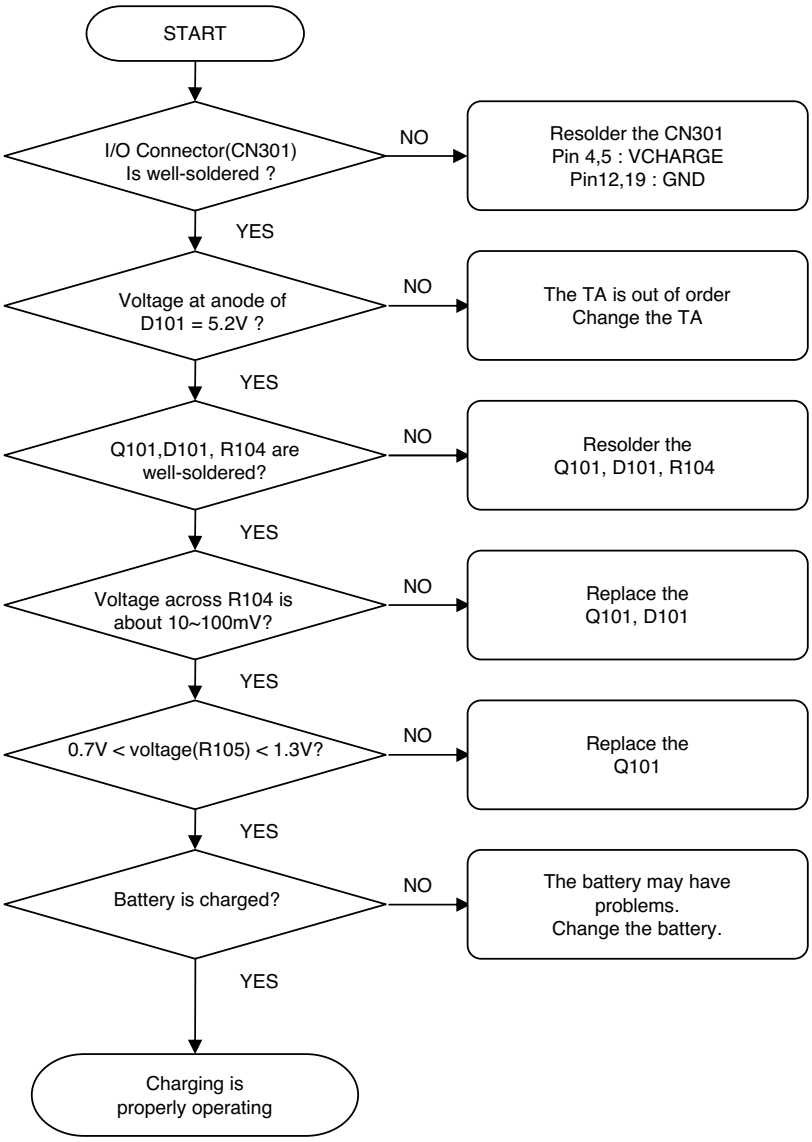



**Figure 4-13(b). Charging Trouble**

## Checking Flow



## 4.7 Vibrator Trouble

### TEST POINT

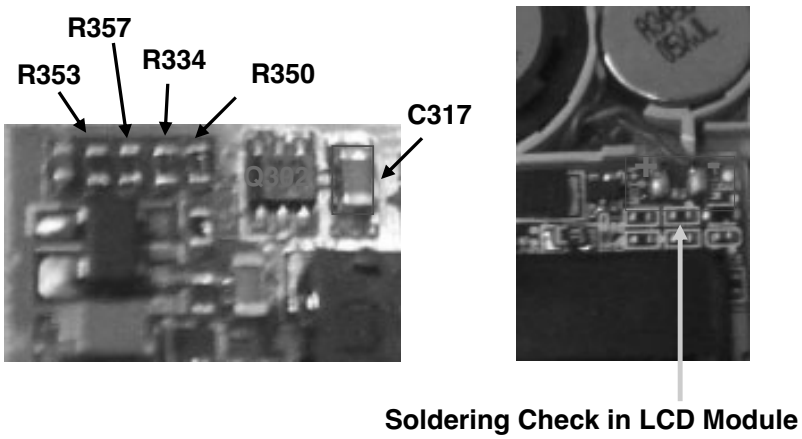



Figure 4-14(a). Vibrator Trouble

### CIRCUIT

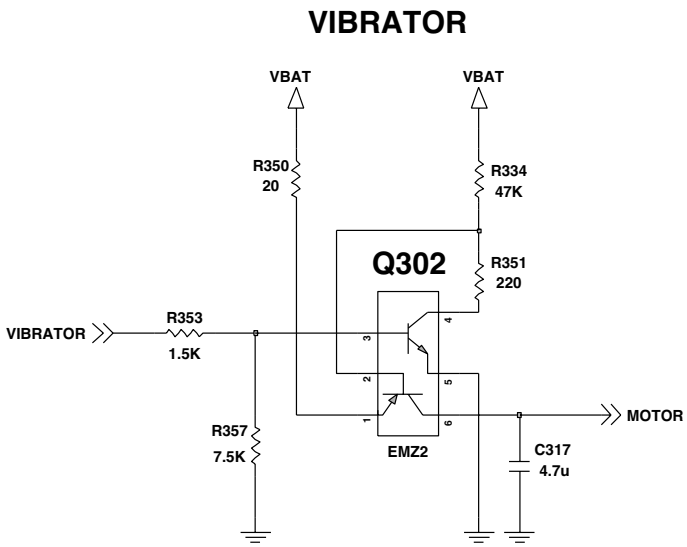
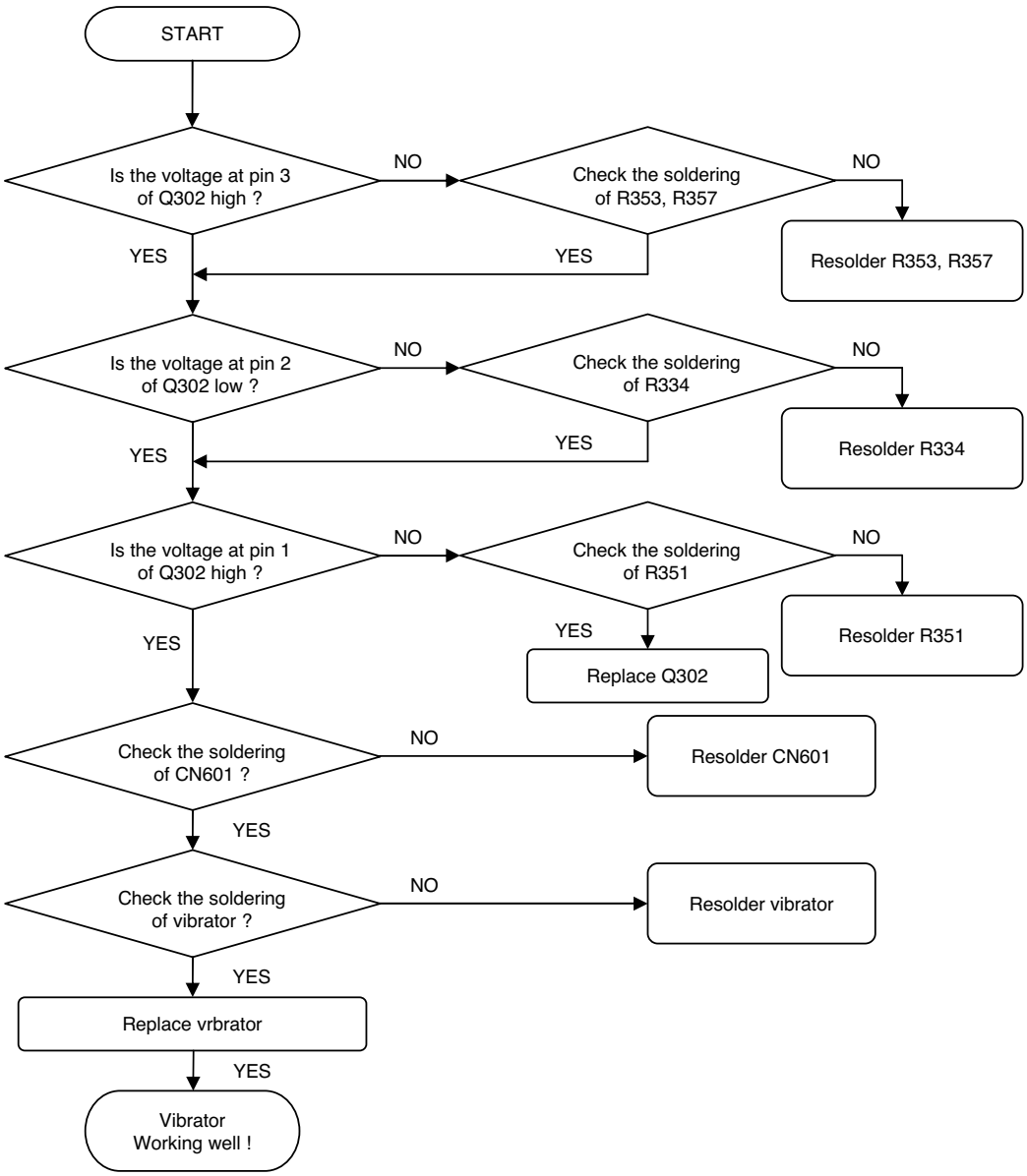



Figure 4-14(b). Vibrator Trouble

## Checking Flow

SETTING : Enter the engineering mode, and set vibrator on at vibration of BB test menu



## 4.8 LCD Trouble

**TEST POINT**

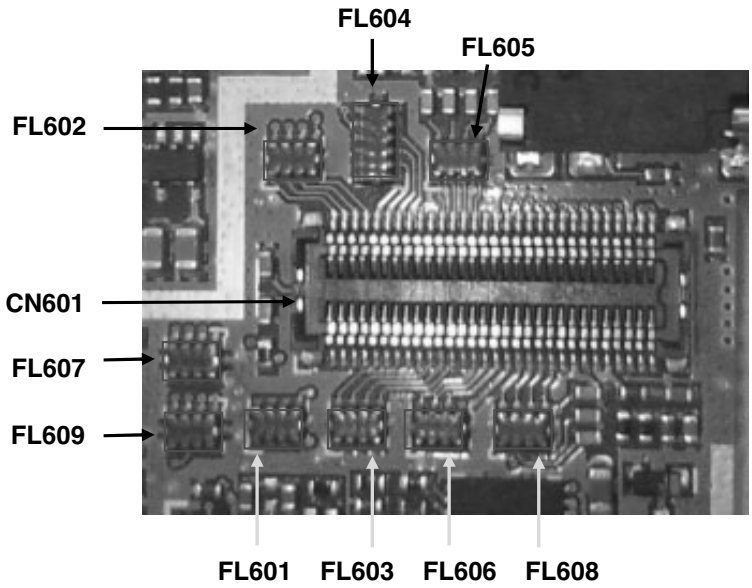



Figure 4-15(a). LCD Trouble

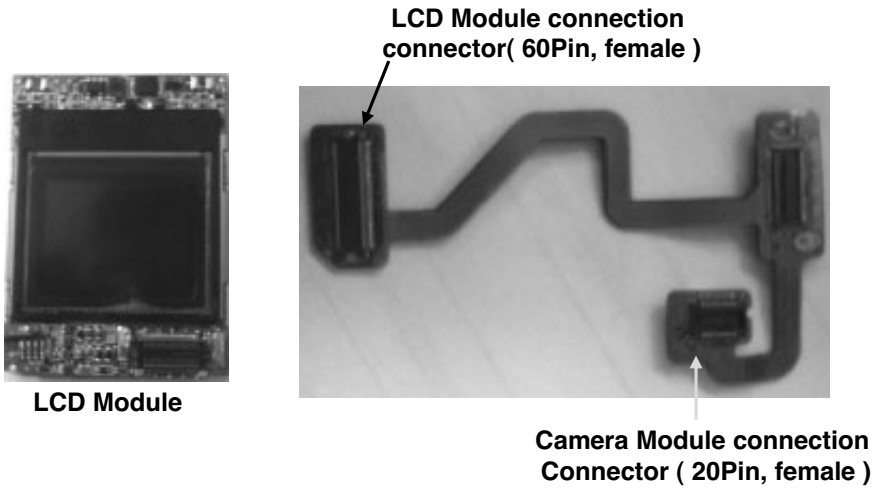
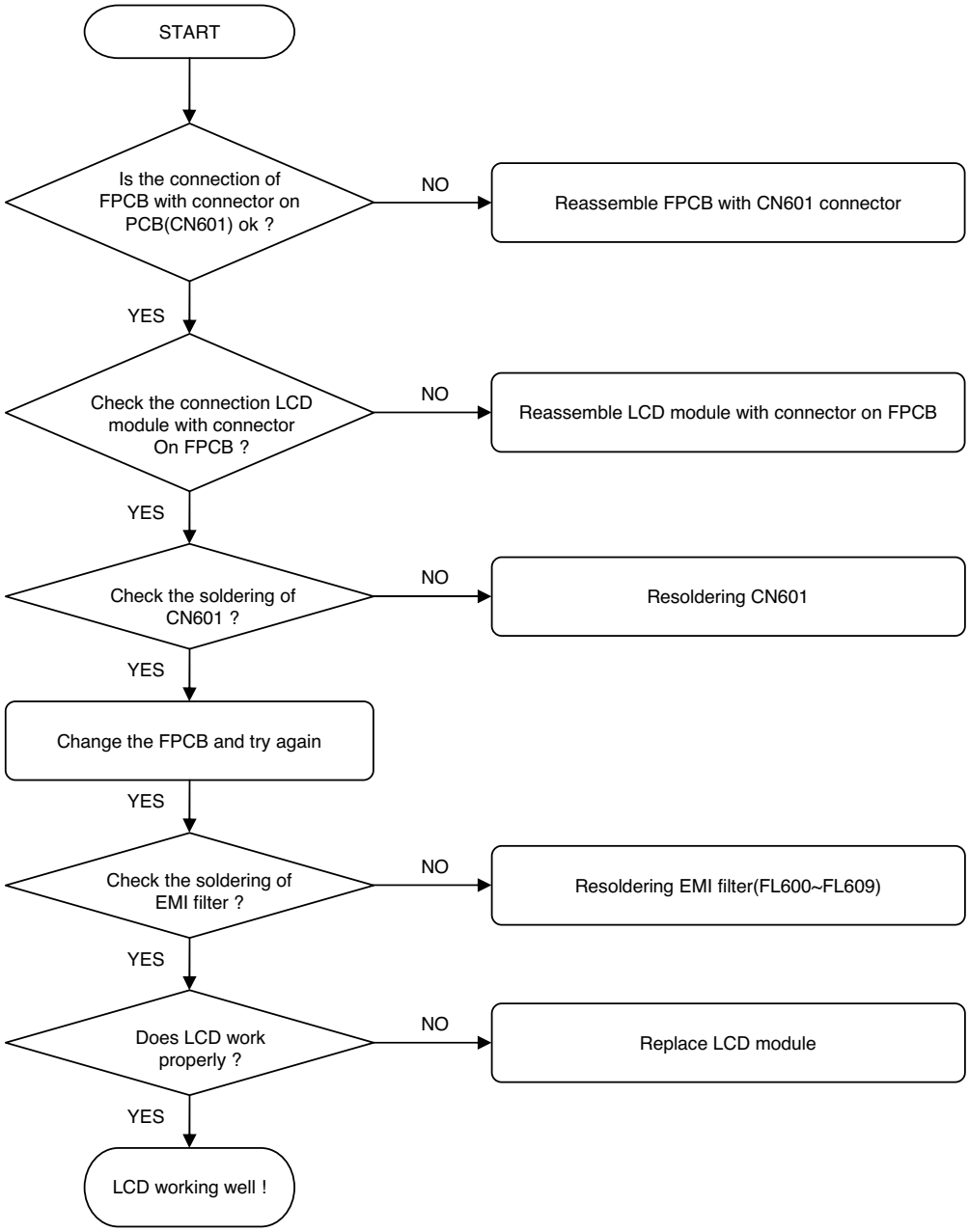



Figure 4-15(b). LCD Trouble

## CHECKING FLOW



## 4.9 Camera Trouble

**TEST POINT**

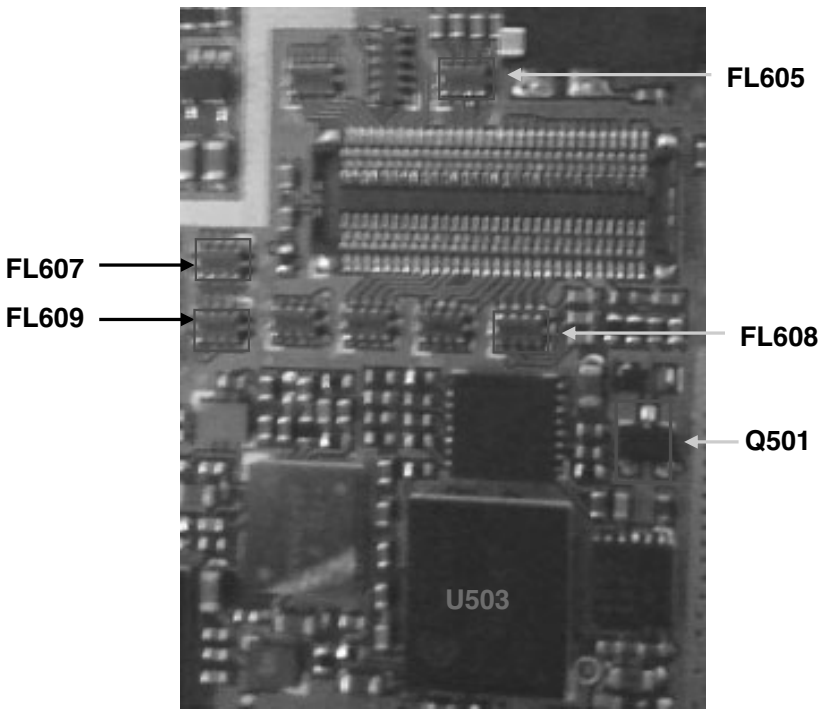



**Figure 4-16(a). Camera Trouble**

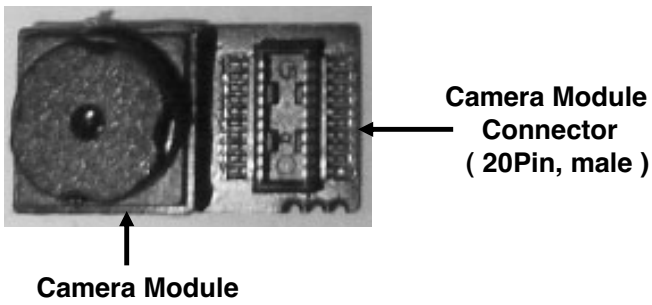
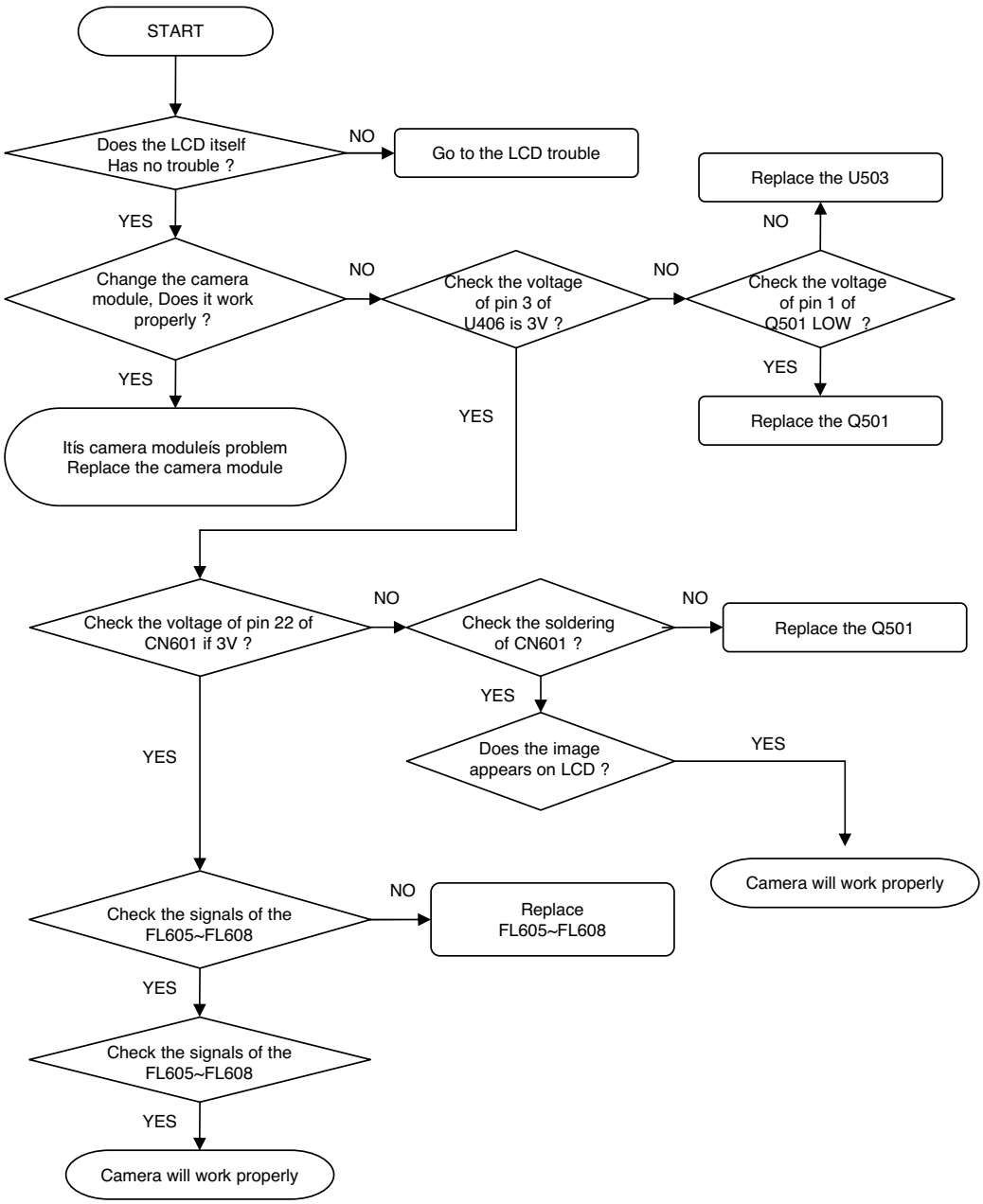



**Figure 4-16(b). Camera Trouble**

## CHECKING FLOW



## 4.10 Speaker Trouble

### Checking Flow

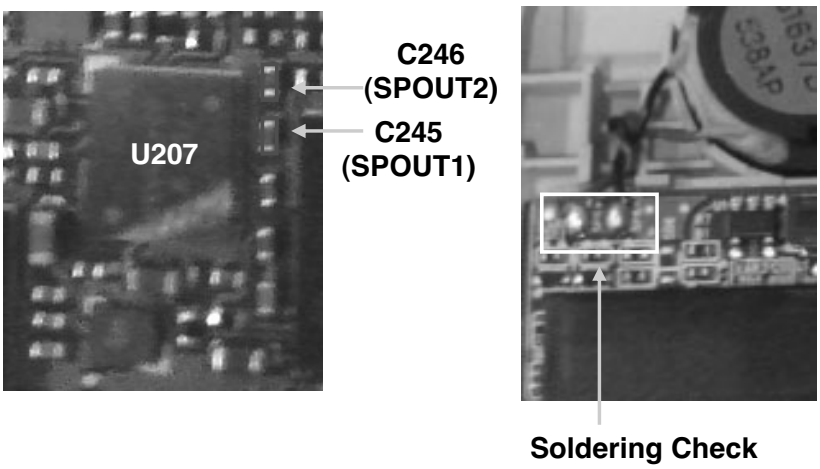



**Figure 4-17(a). Speaker Trouble**

### CIRCUIT

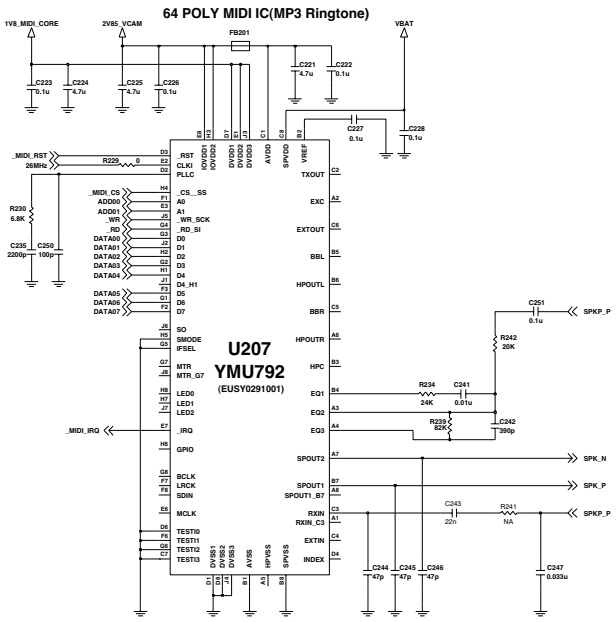
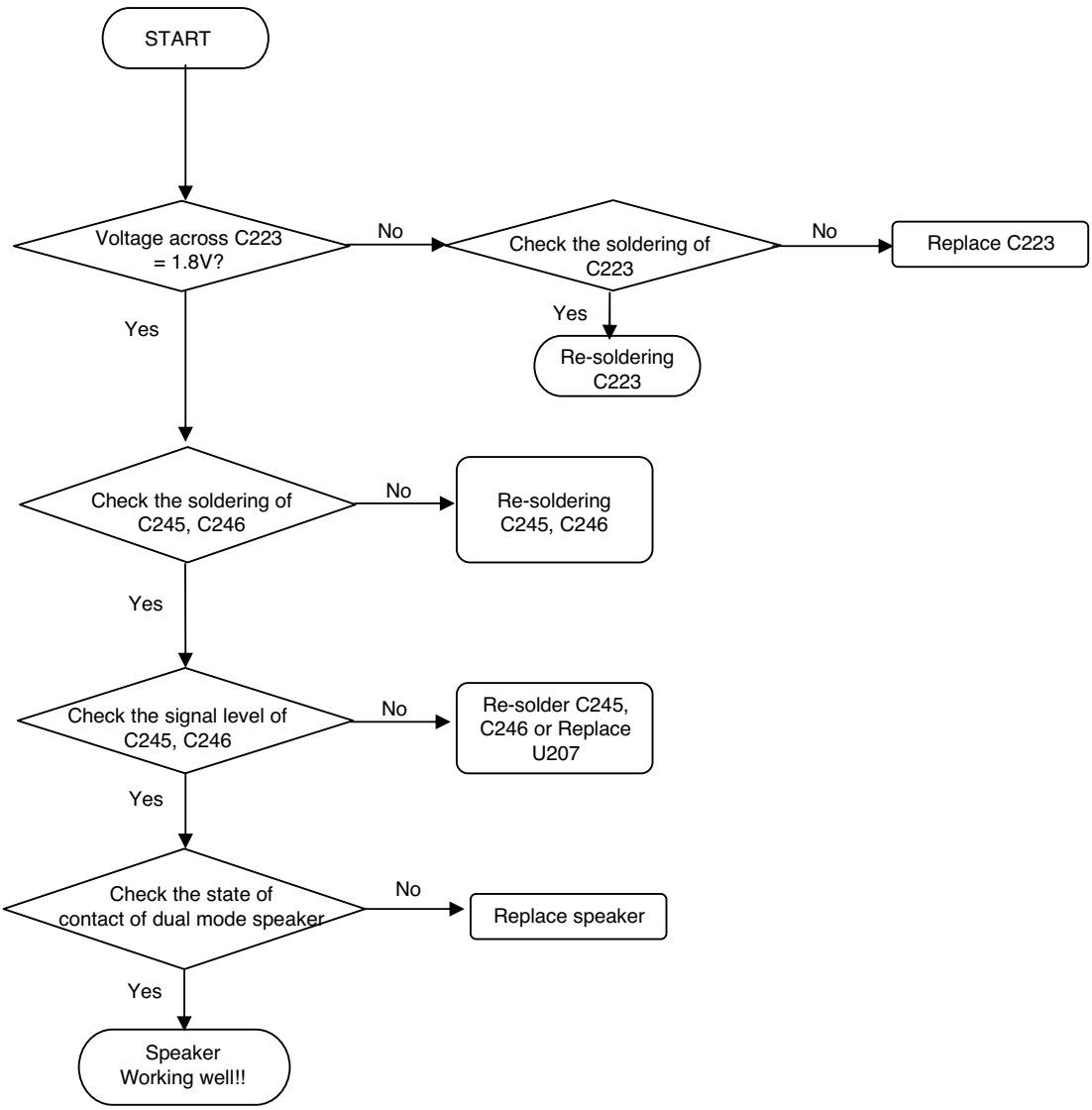



**Figure 4-17(b). Speaker Trouble**

## CHECKING FLOW



## 4.11 SIM Card Interface Trouble

### TEST POINT

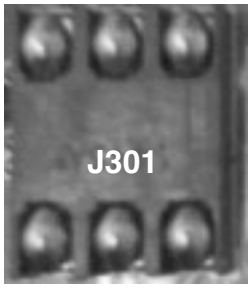



**Figure 4-18(a). Sim Card Interface**

### CIRCUIT

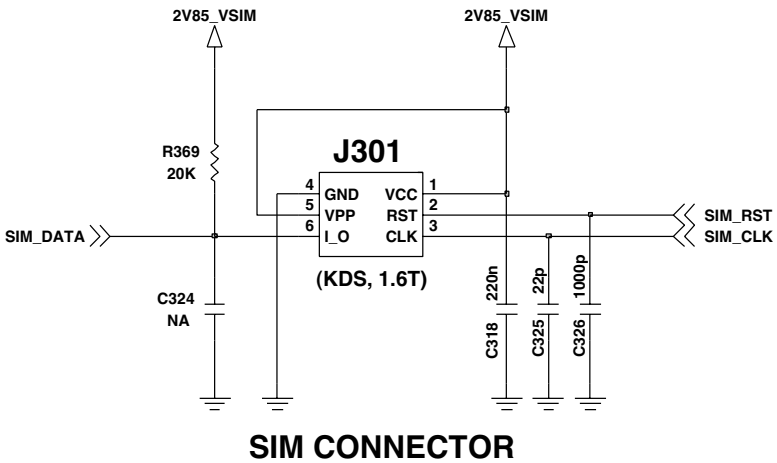
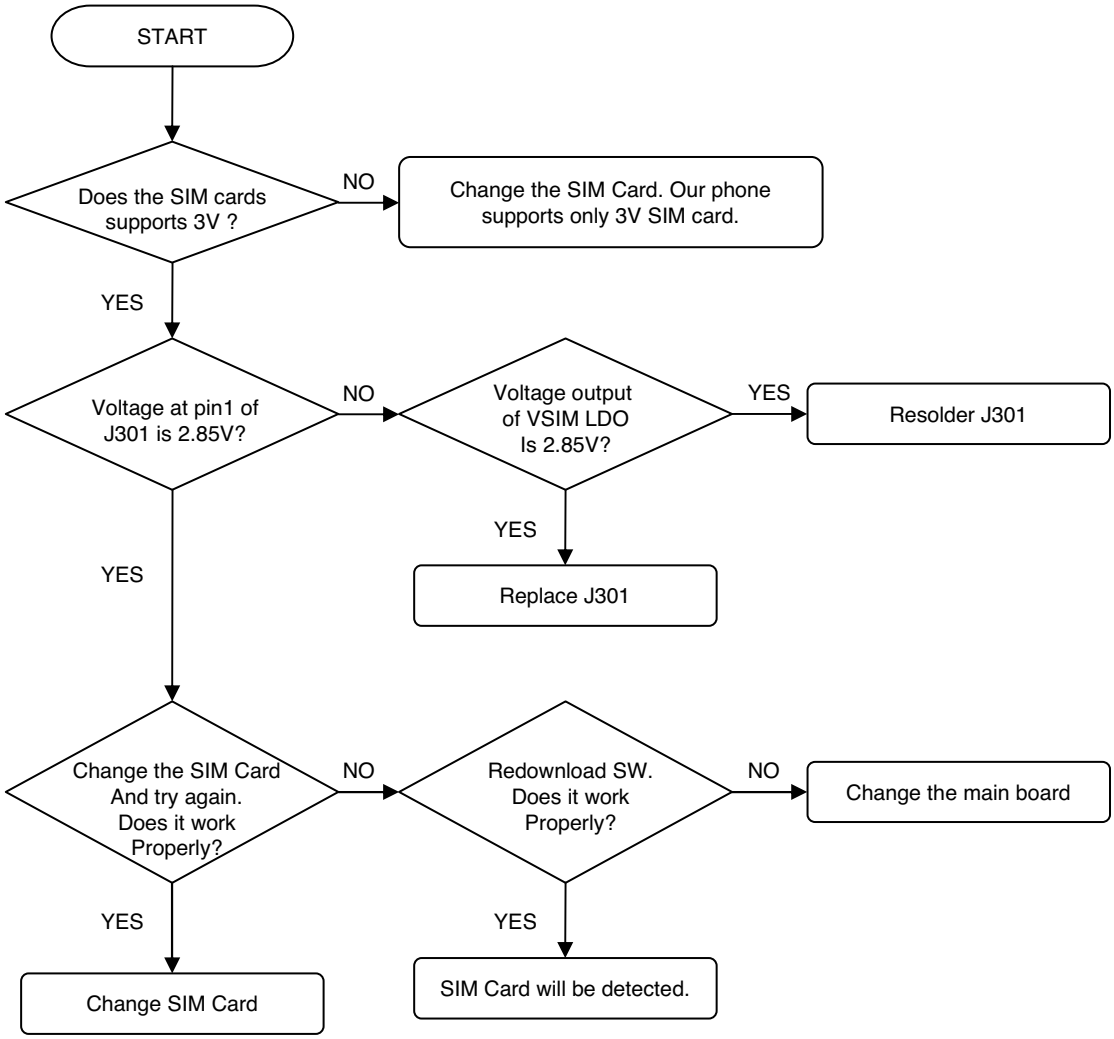



**Figure 4-18(b). Sim Card Interface**

## CHECKING FLOW



## 4.12 Earphone Trouble

### TEST POINT

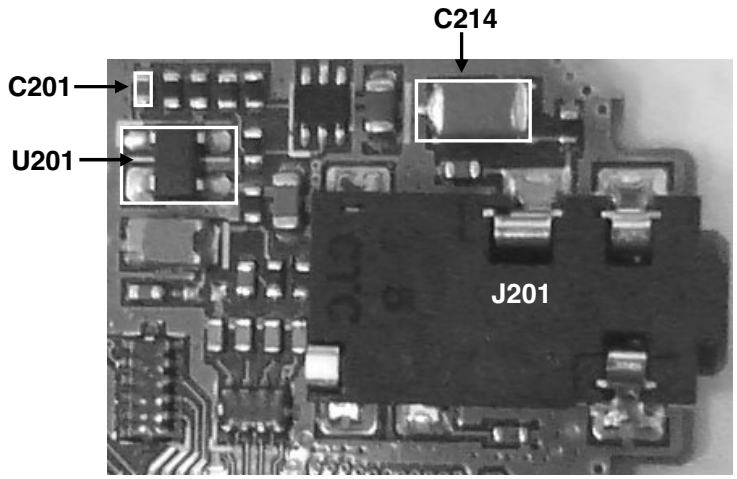



Figure 4-19(a). Earphone Trouble

### CIRCUIT

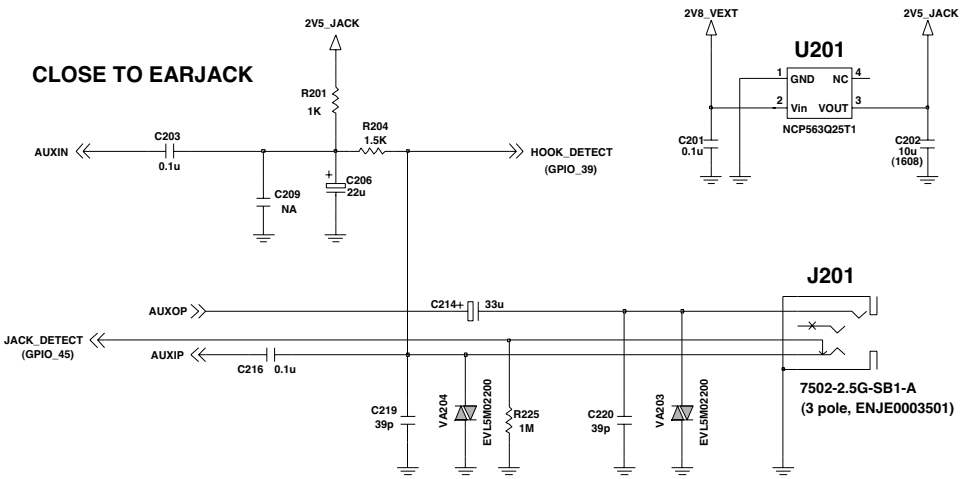
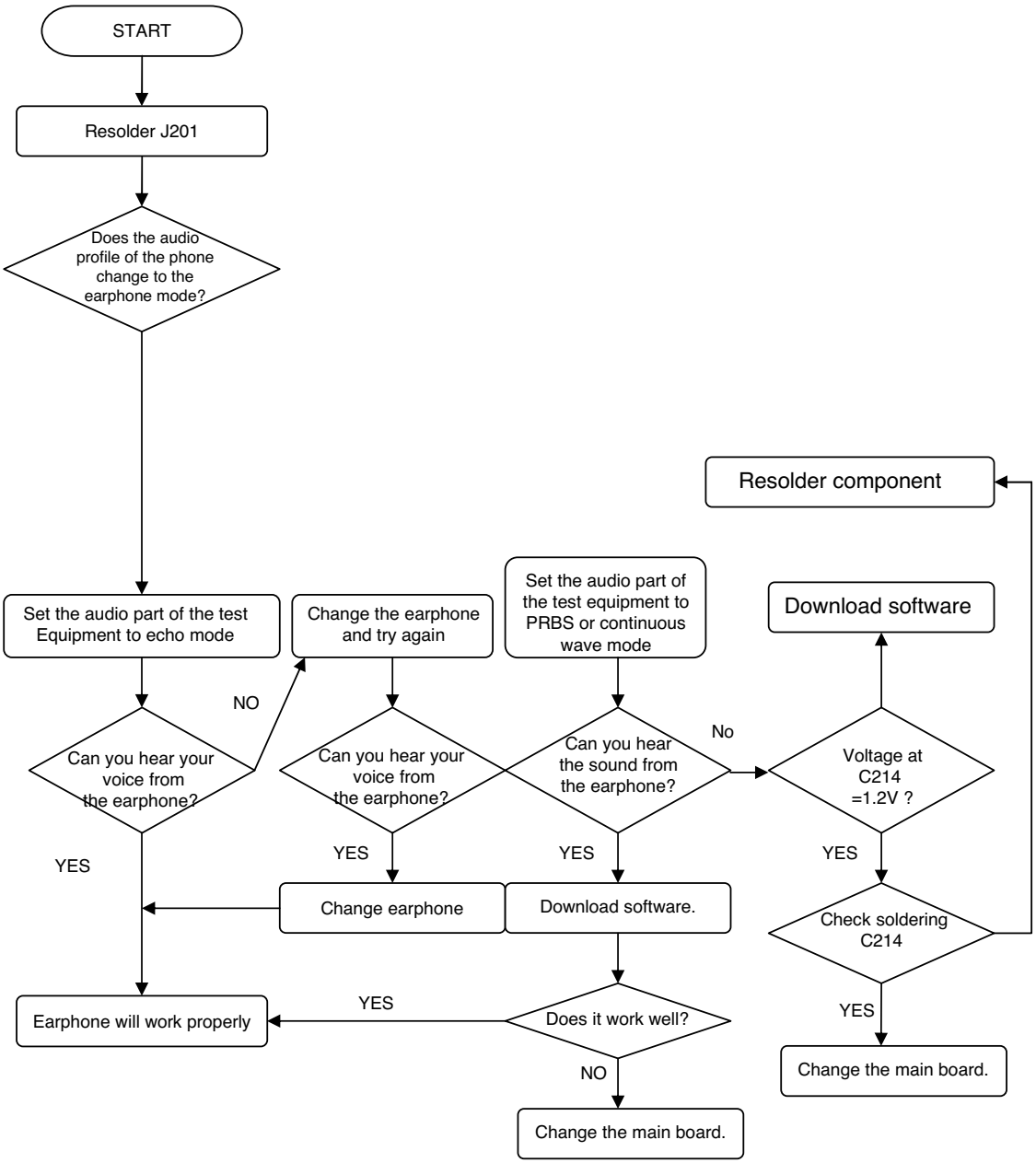



Figure 4-19(b). Earphone Trouble

## CHECKING FLOW



## 4.13 KEY backlight Trouble

**TEST POINT**

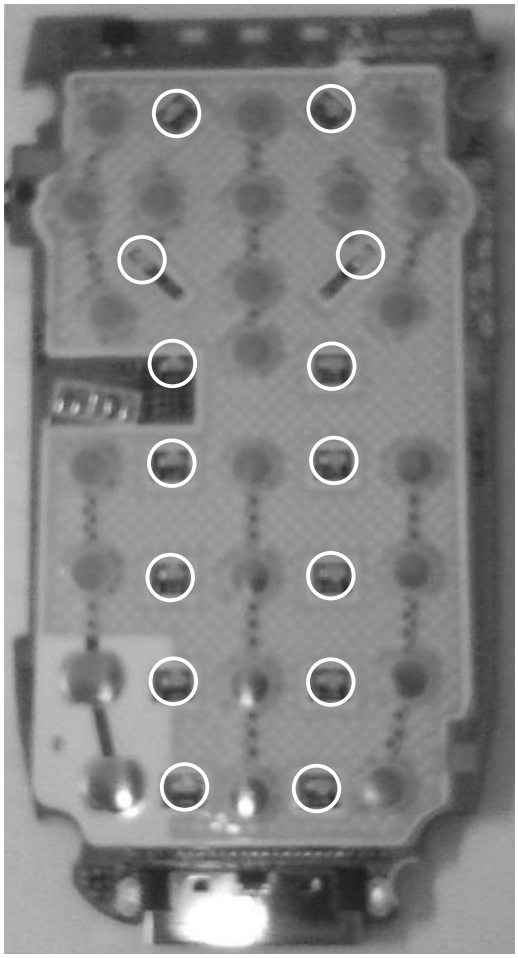


**Figure 4-20(a). KEY Backlight Trouble**

## CIRCUIT

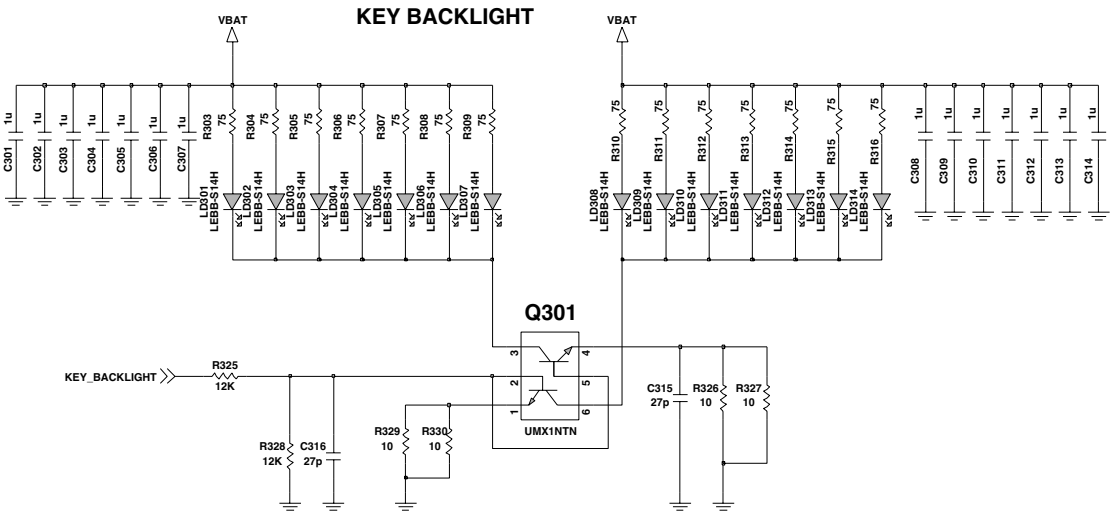
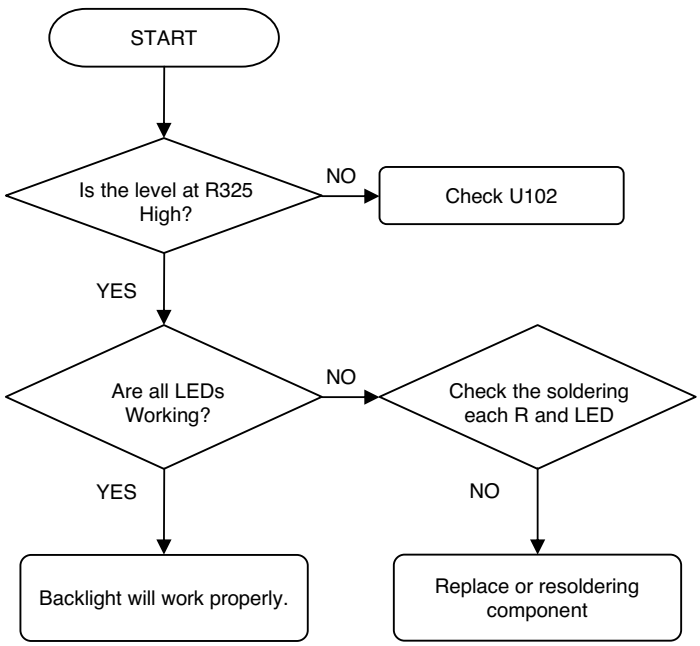



**Figure 4-20(b). KEY Backlight Trouble**

## CHECKING FLOW



## 4.14 Receiver Trouble

### TEST POINT

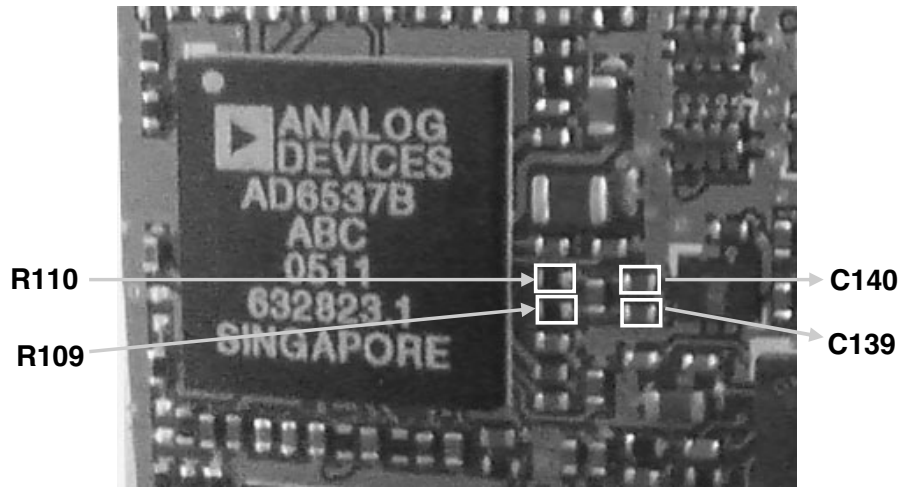



Figure 4-21(a). Receiber Trouble

### CIRCUIT

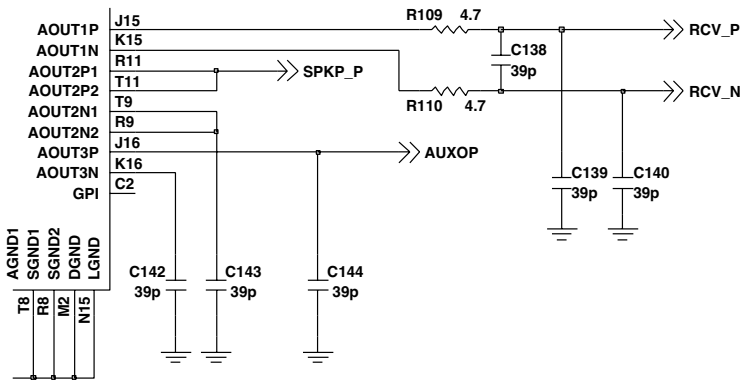
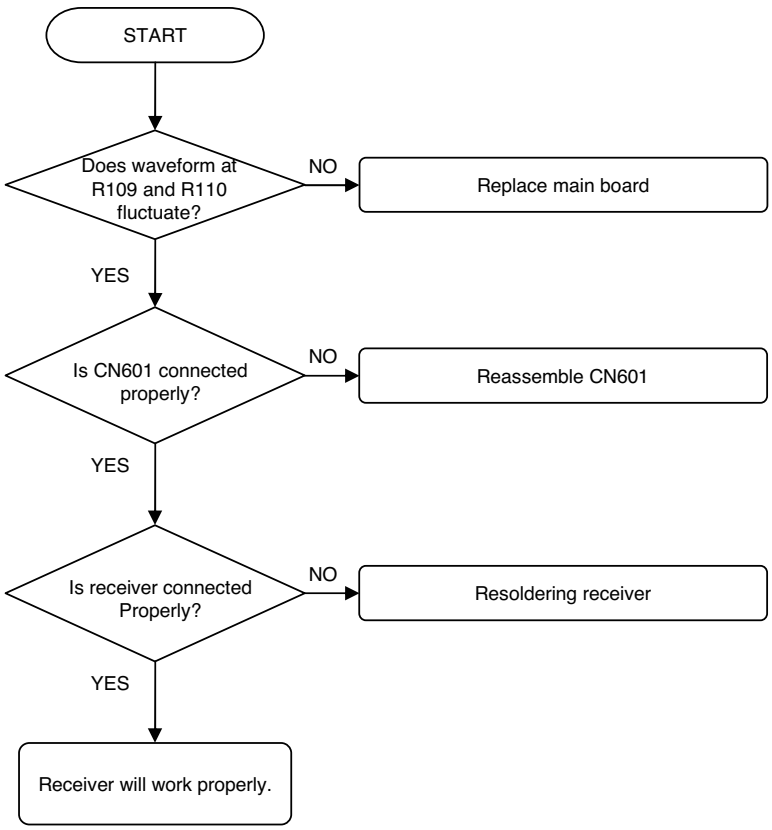



Figure 4-21(b). Receiver Trouble

## CHECKING FLOW

SETTING : After initialize Agilent 8960, Test EGSM, DCS mode

Set the property of audio as PRBS or continuous wave. Set the receiving volume of mobile as Max.



## 4.15 Microphone Trouble

### TEST POINT

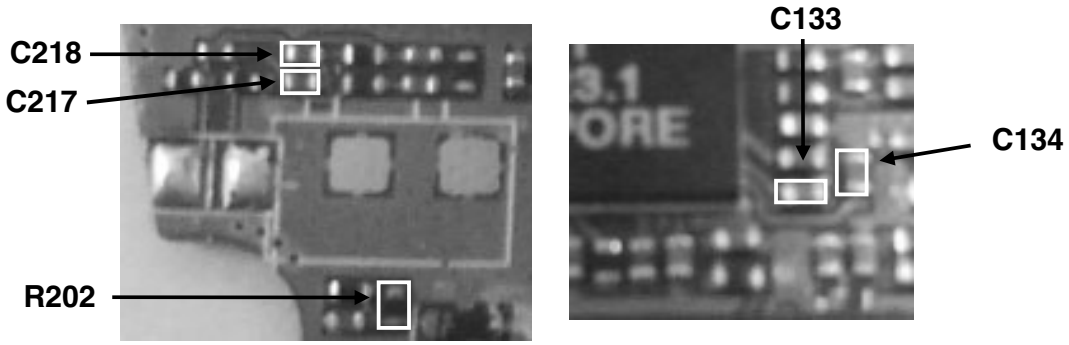



Figure 4-22(a). Microphone Trouble

### CIRCUIT

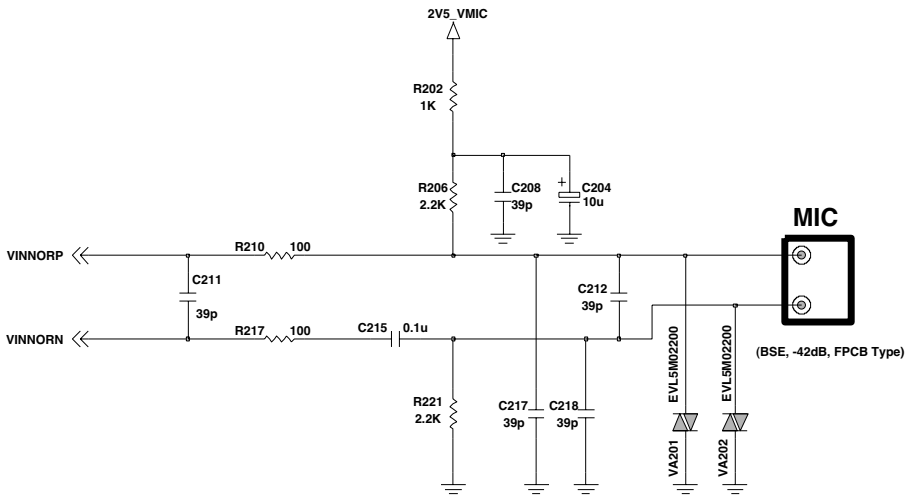
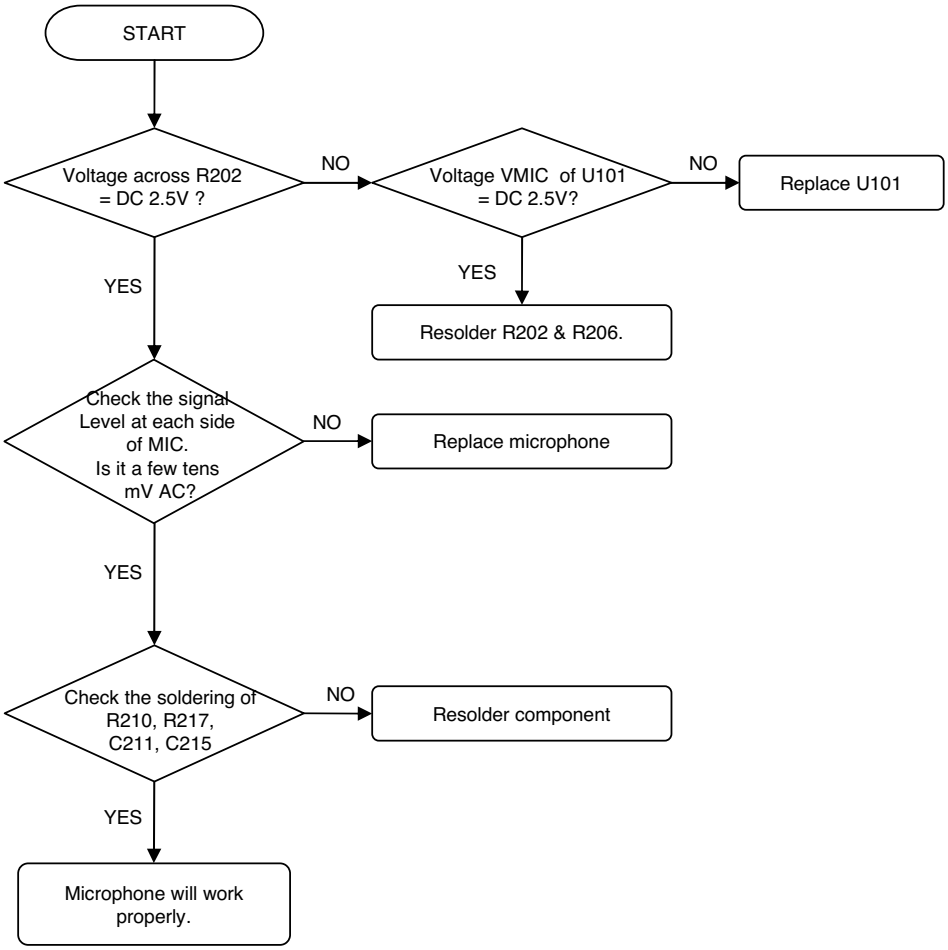



Figure 4-22(b). Microphone Trouble

## CHECKING FLOW

SETTING : After initialize Agilent 8960, Test EGSM, DCS mode



## 4.16 RTC Trouble

### TEST POINT

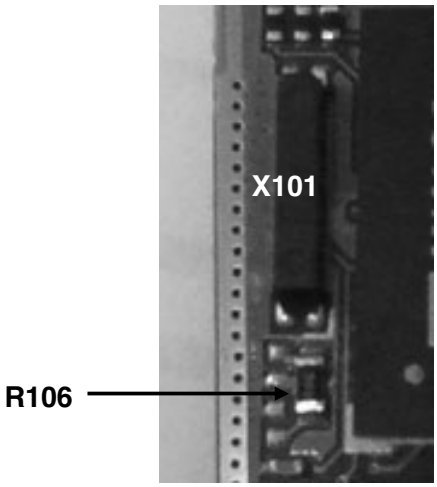



Figure 4-23(a). RTC Trouble

### CIRCUIT

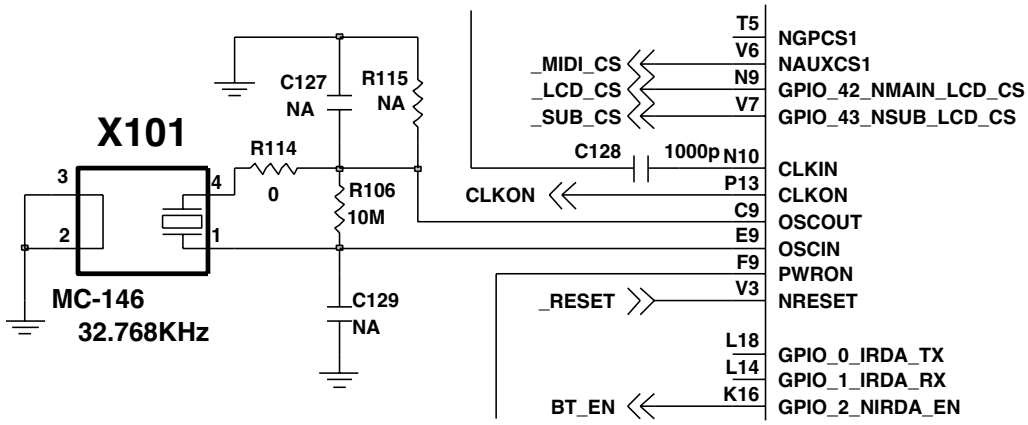



Figure 4-23(b). RTC Trouble

## 4.17 Folder on/off Trouble

**TEST POINT**

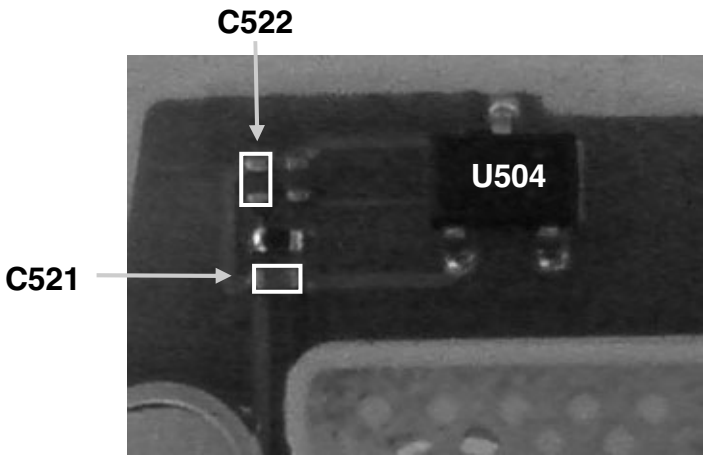



Figure 4-25(a). Folder On/Off Trouble

**CIRCUIT**

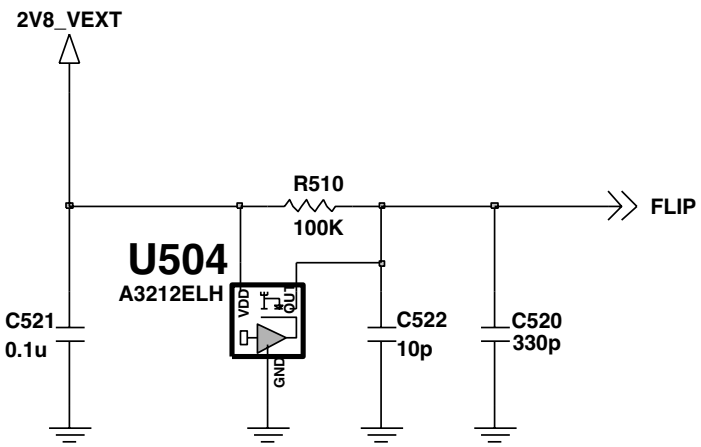



Figure 4-25(b). Folder On/Off Trouble

# 5. DOWNLOAD AND CALIBRATION

## 5.1 Download Setup

### 5.1.1 In case of using the Data kit

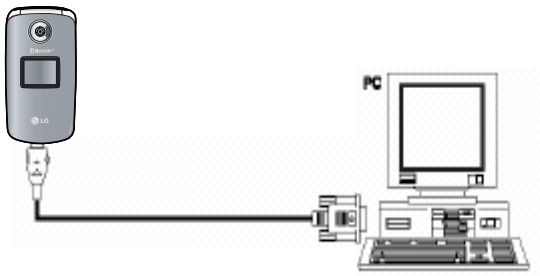


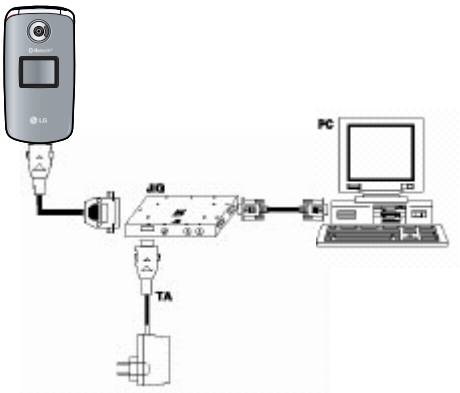

**Figure 5-1 Describes Download Setup**

**Preparation**

- Target Handset
- Data kit
- Battery
- IBM compatible PC supporting RS-232 with Windows 98 or newer

**If you use data kit, you should have a battery with the voltage above 3.7V.**

### 5.1.2 In case of using the PIF



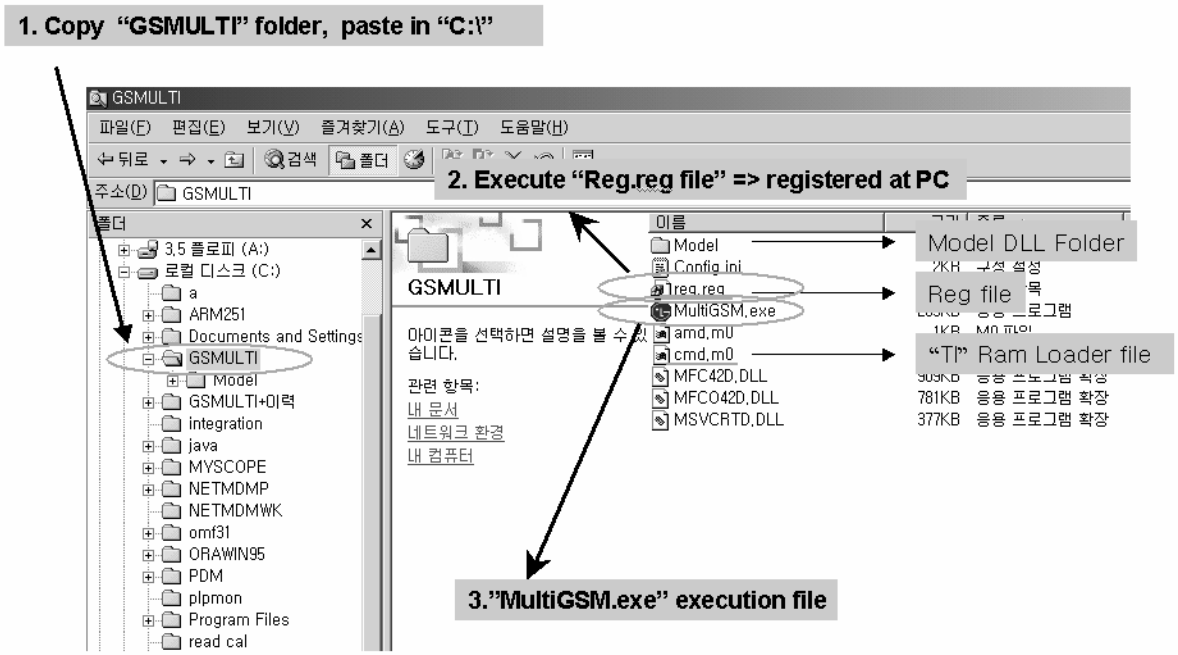

**Preparation**

- Target Handset
- PIF
- RS-232 Cable and PIF-to-Phone interface Cable
- TA/Power Supply or Battery
- BM compatible PC supporting RS-232 with Windows 98 or newer

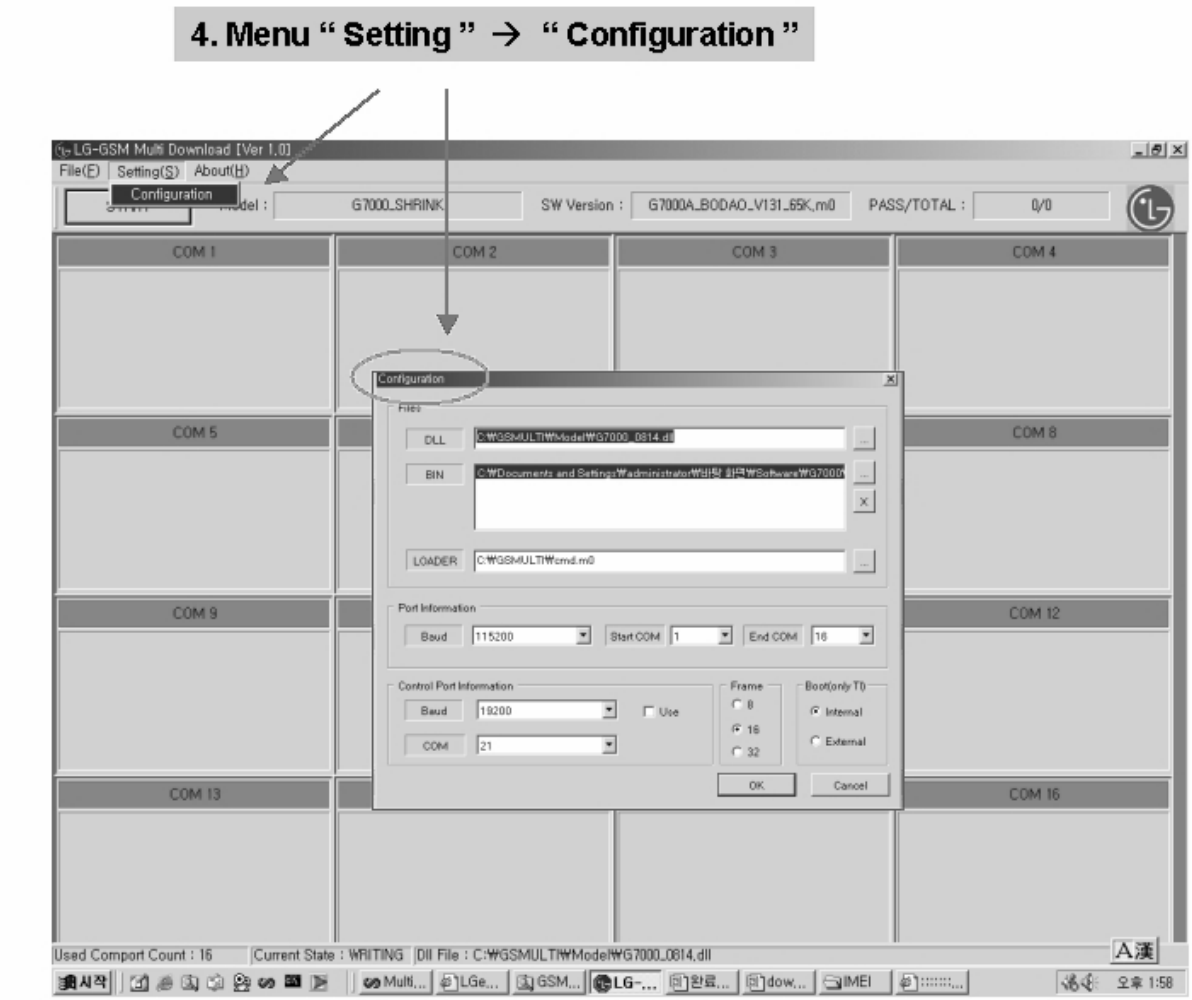
**If you use battery, you should have a battery with the voltage above 3.7V.**

## 5.2 Download Procedure

### 5.2.1. Computer Program file -> MultiGSM.exe Click

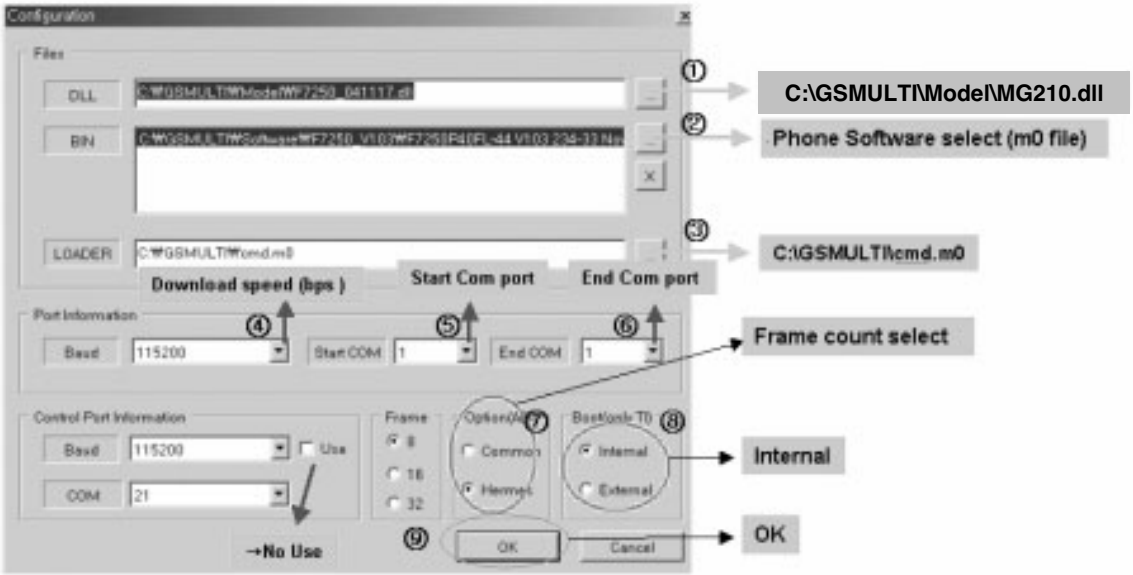


**5.2.2. Click the “Setting” button.**
**Then, choose Configuration which is going to download.**



### 5.2.3. Configuration Setting

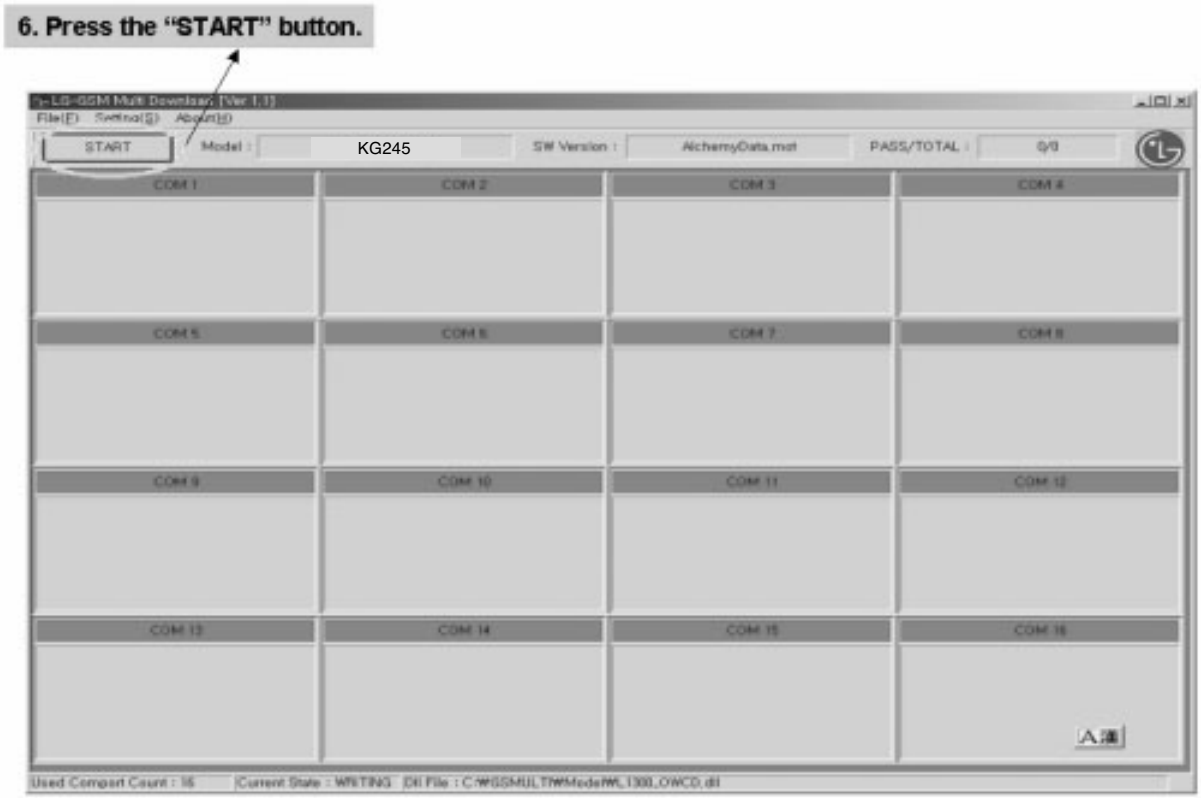
**5. Configuration : Select values like below**




■ Download speed :TI Model →115200bps, ADI Model →460800bps
■ Start COM:1, End COM:16
■ Frame:16

→ 16port Setting
Default condition

### 5.2.4. Press “Start Button”.

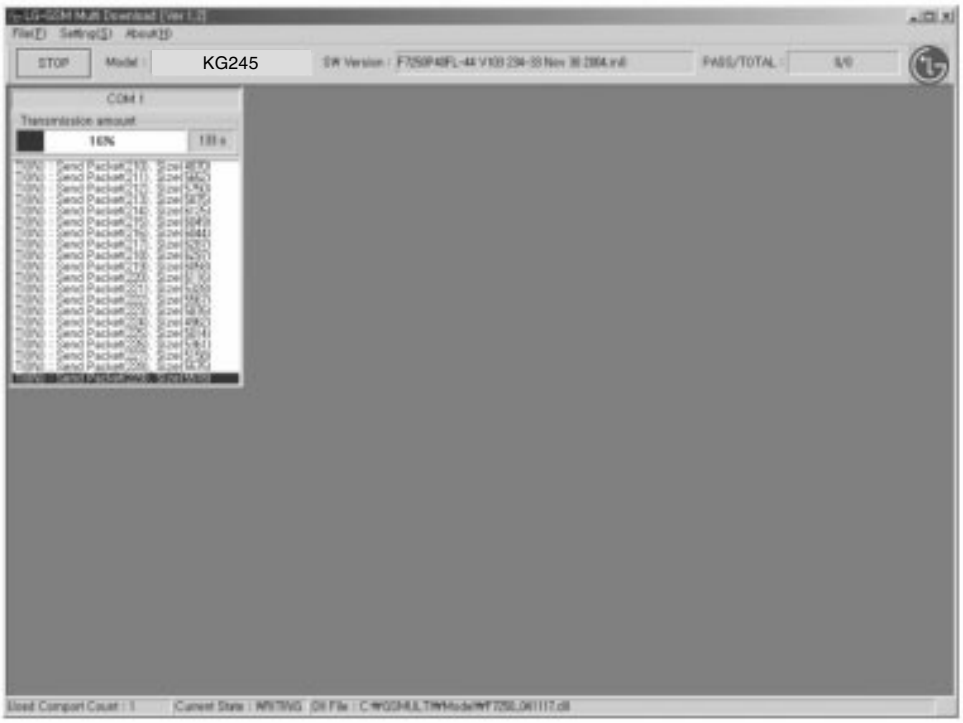


### 5.2.5. After “Start Button”, Which Stand-by condition

**7. Stand-by Condition: “ Wait phone connecting “ is displayed → Connect the Phone.**

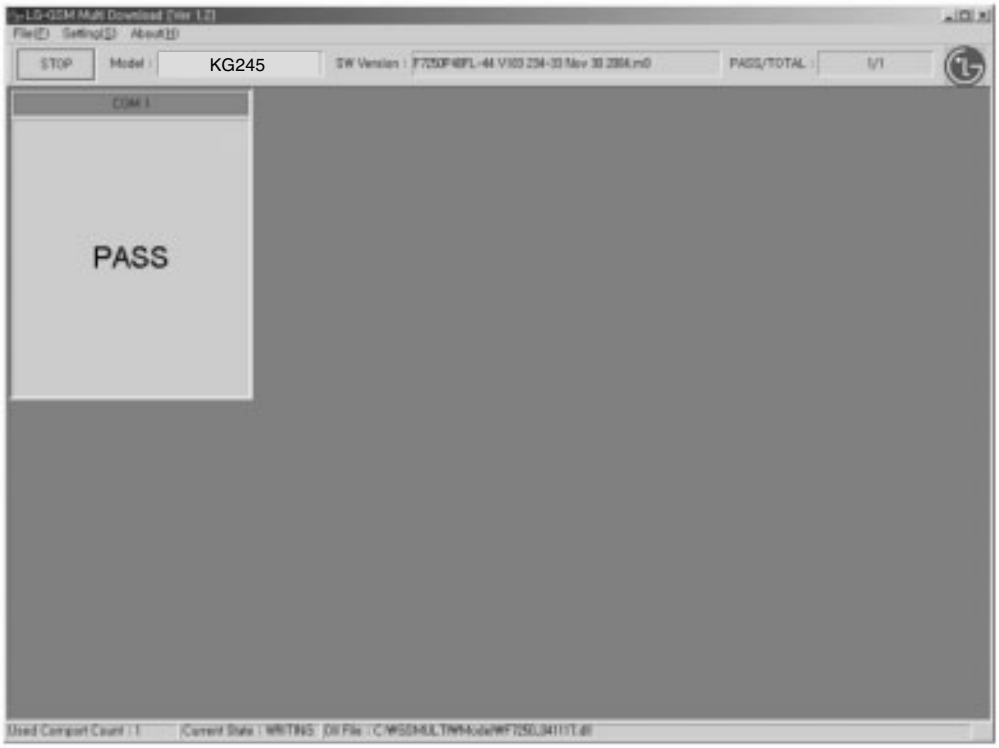
### 5.2.6. SW downloading Condition.

※ Downloading : Start



### 5.2.7. SW downloading END Condition.

※ Downloading : End



# 5.3 SERVICE AND CALIBRATION

## 5.3.1. Calibration

## A. Equipment Setup

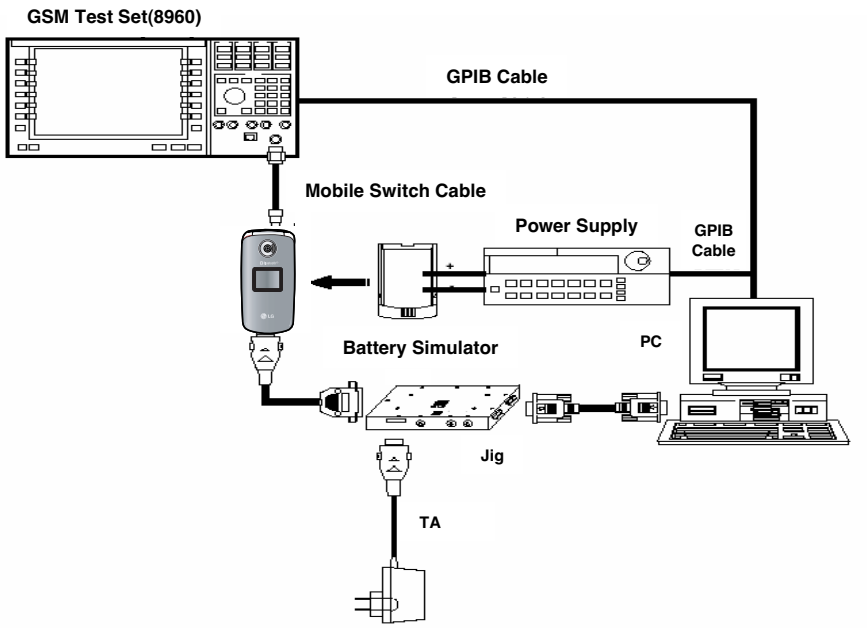
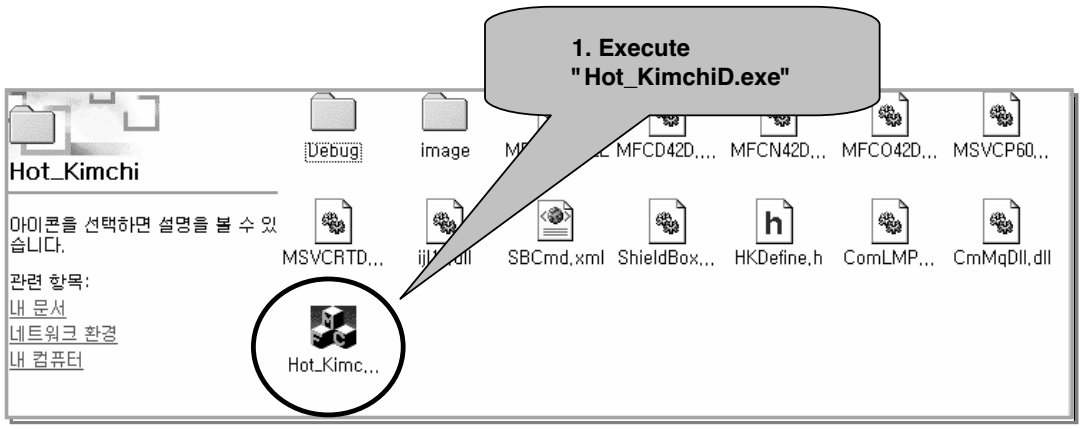
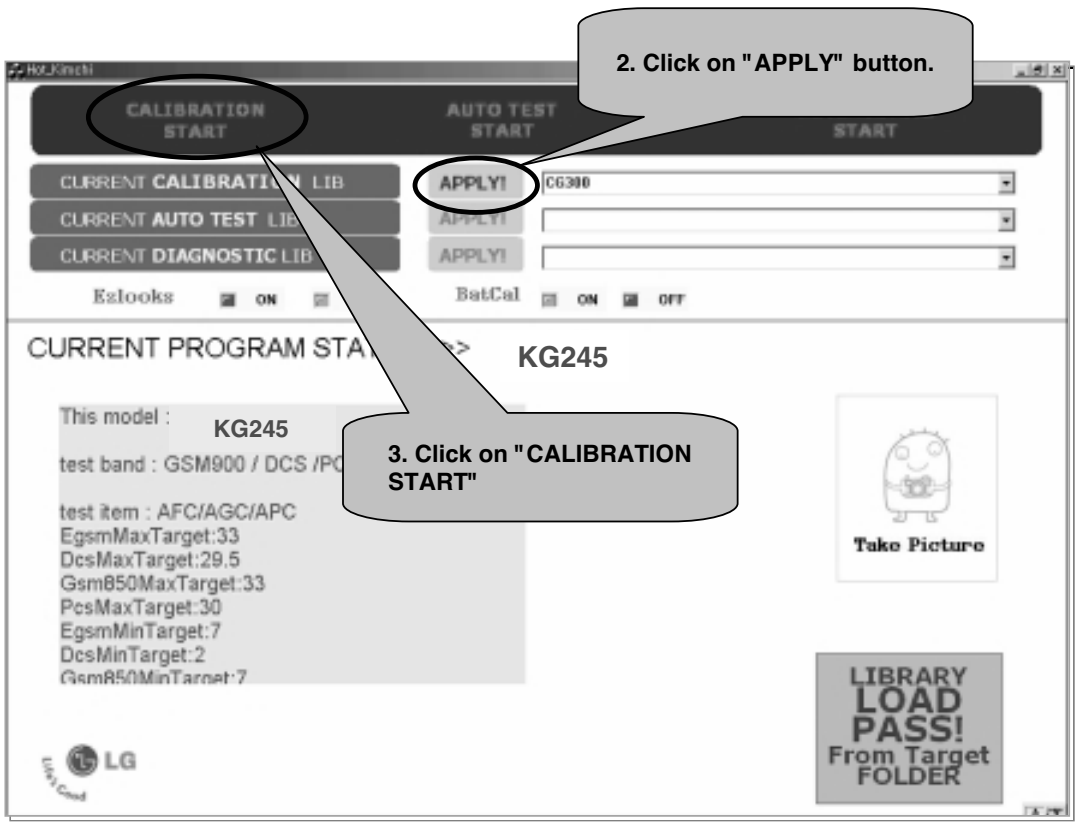


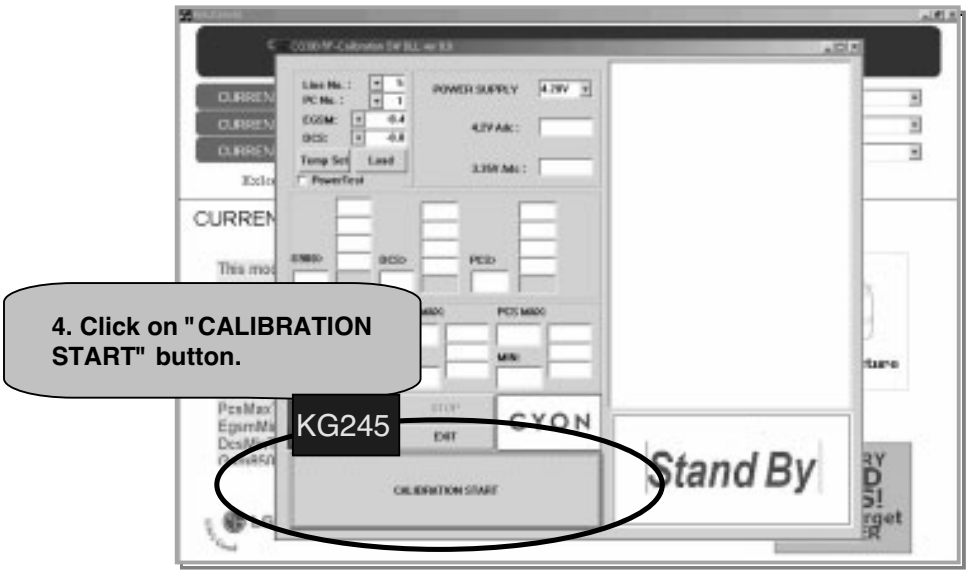

**Figure 5-2 Calibration Equipment List**

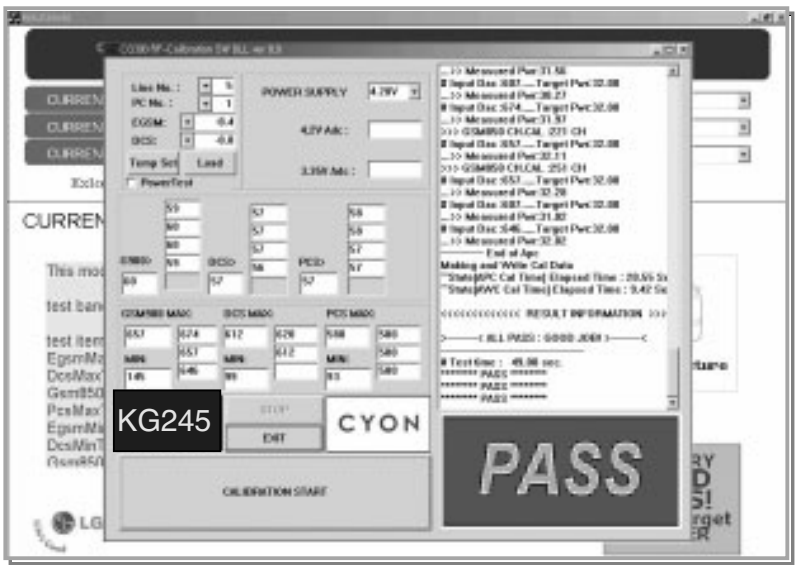
## B. RF Calibration Program



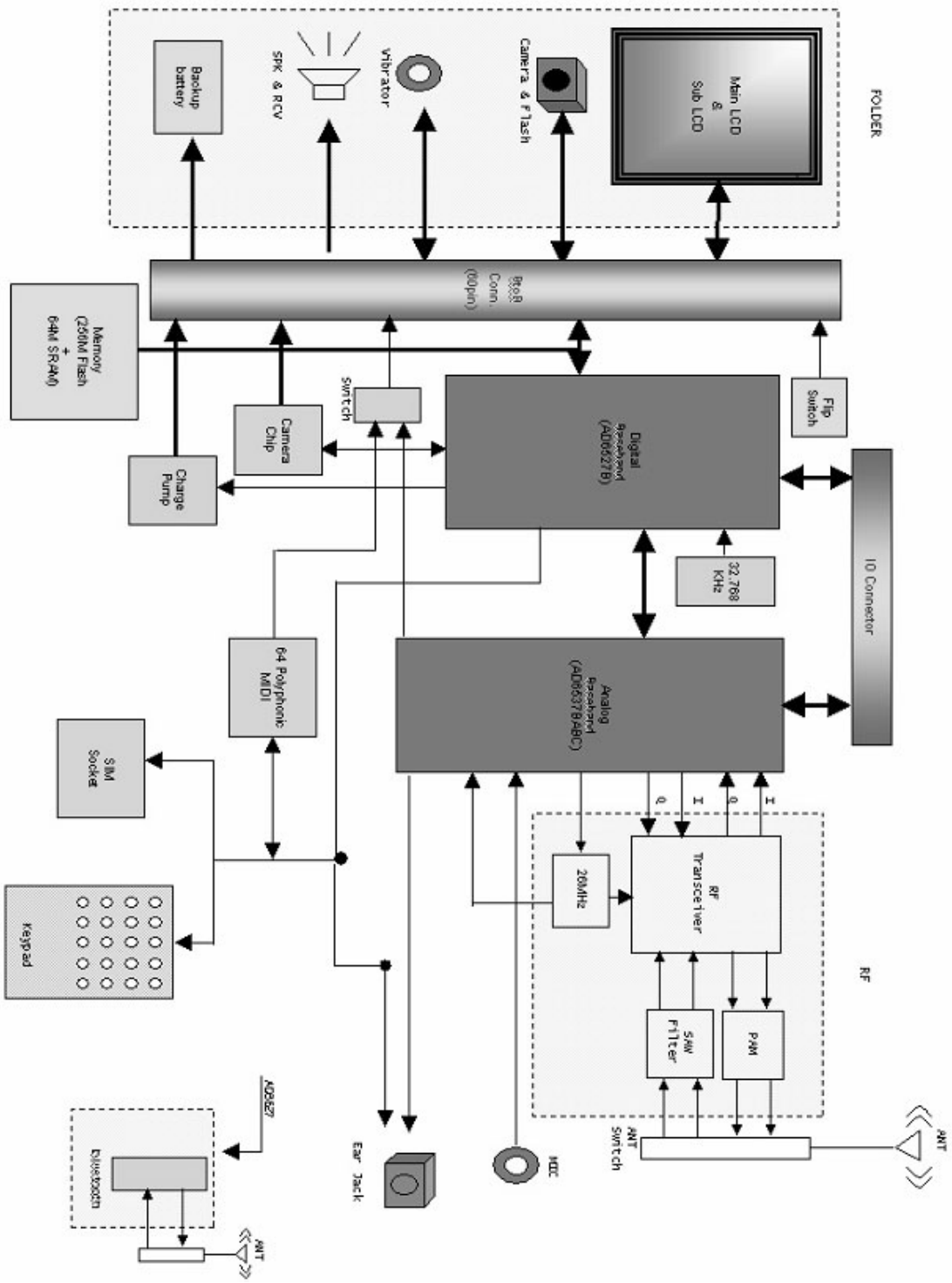



# 5. DOWNLOAD AND CALIBRATION

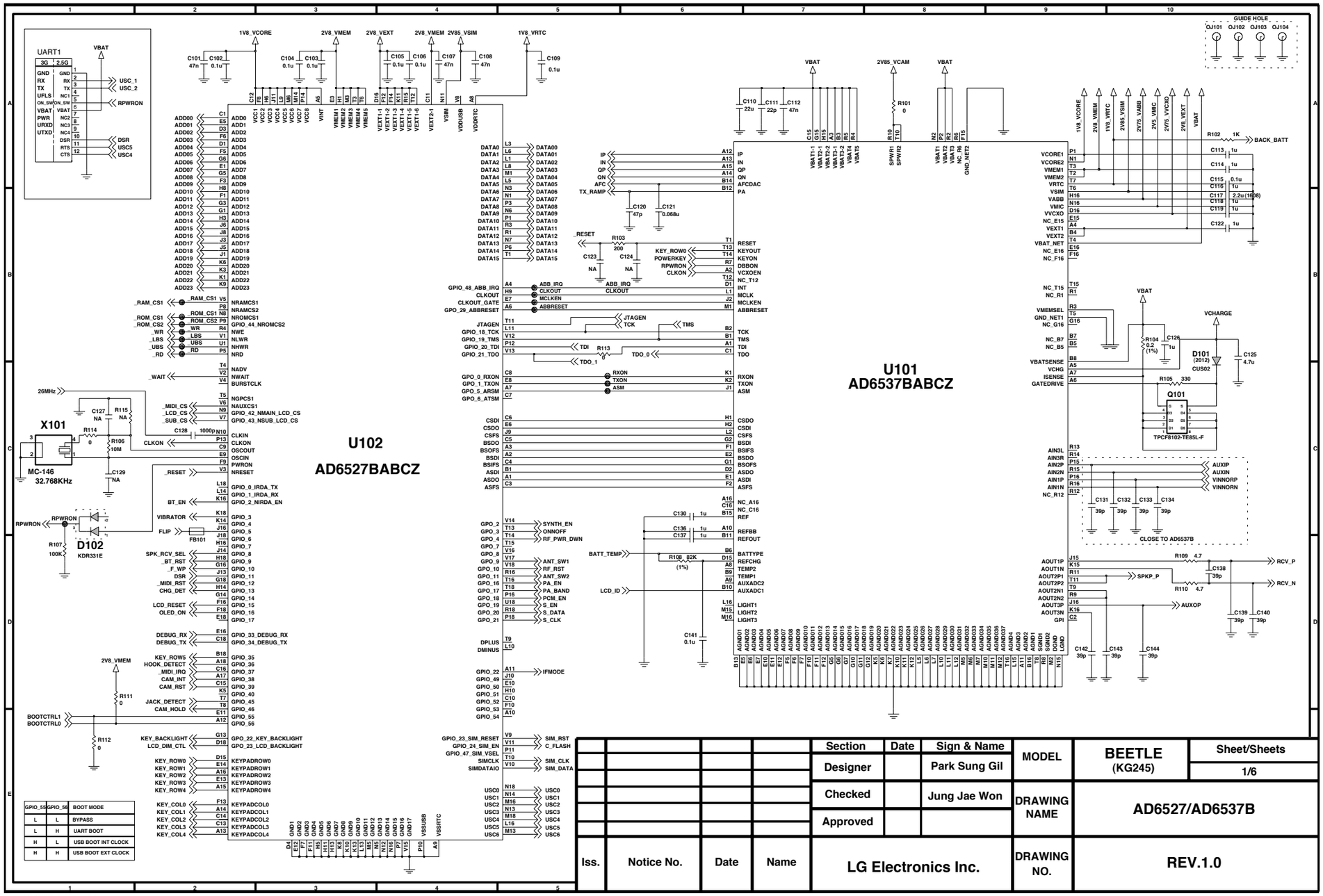


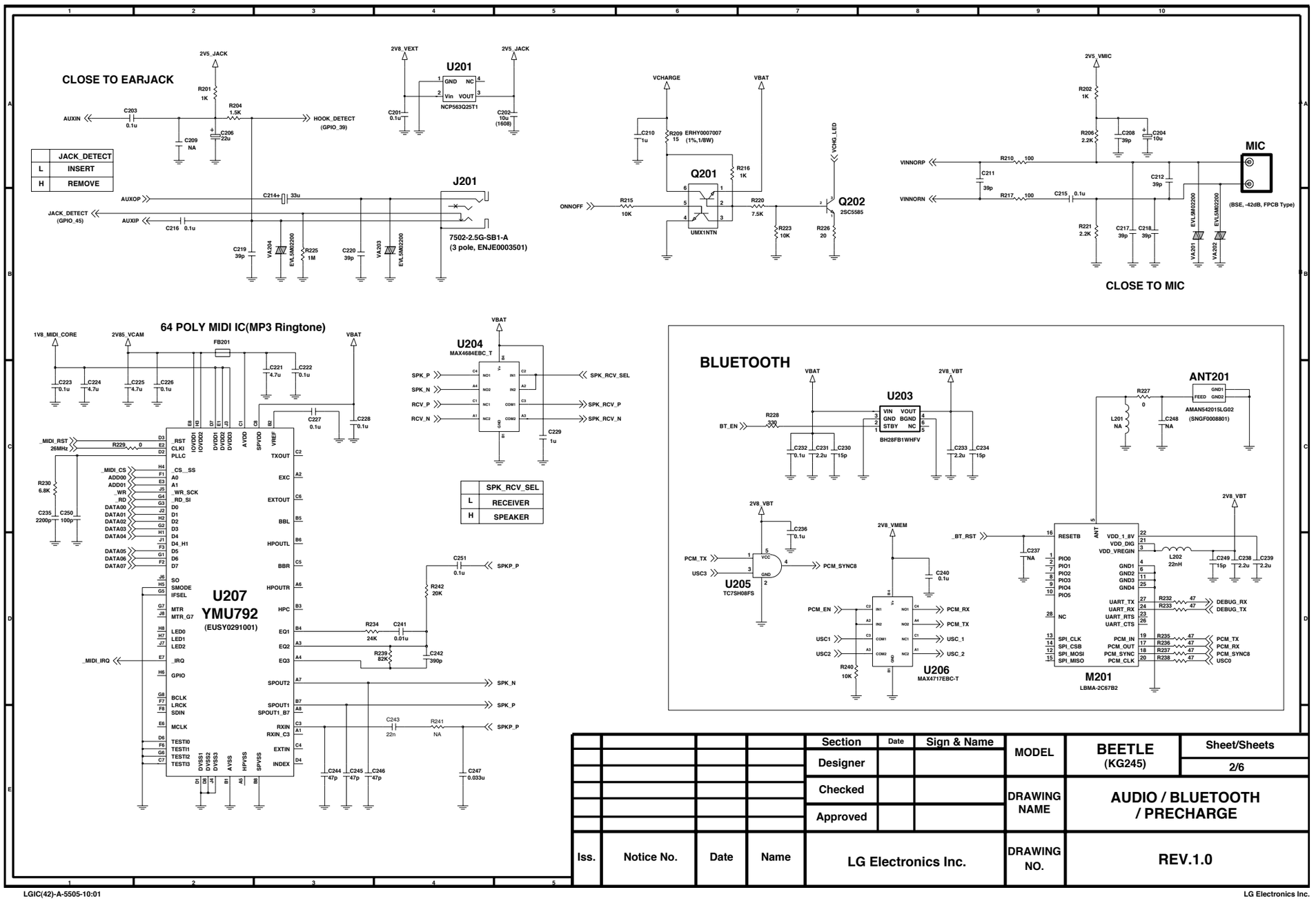
# 6. BLOCK DIAGRAM



# 7. CIRCUIT DIAGRAM



# 7. CIRCUIT DIAGRAM

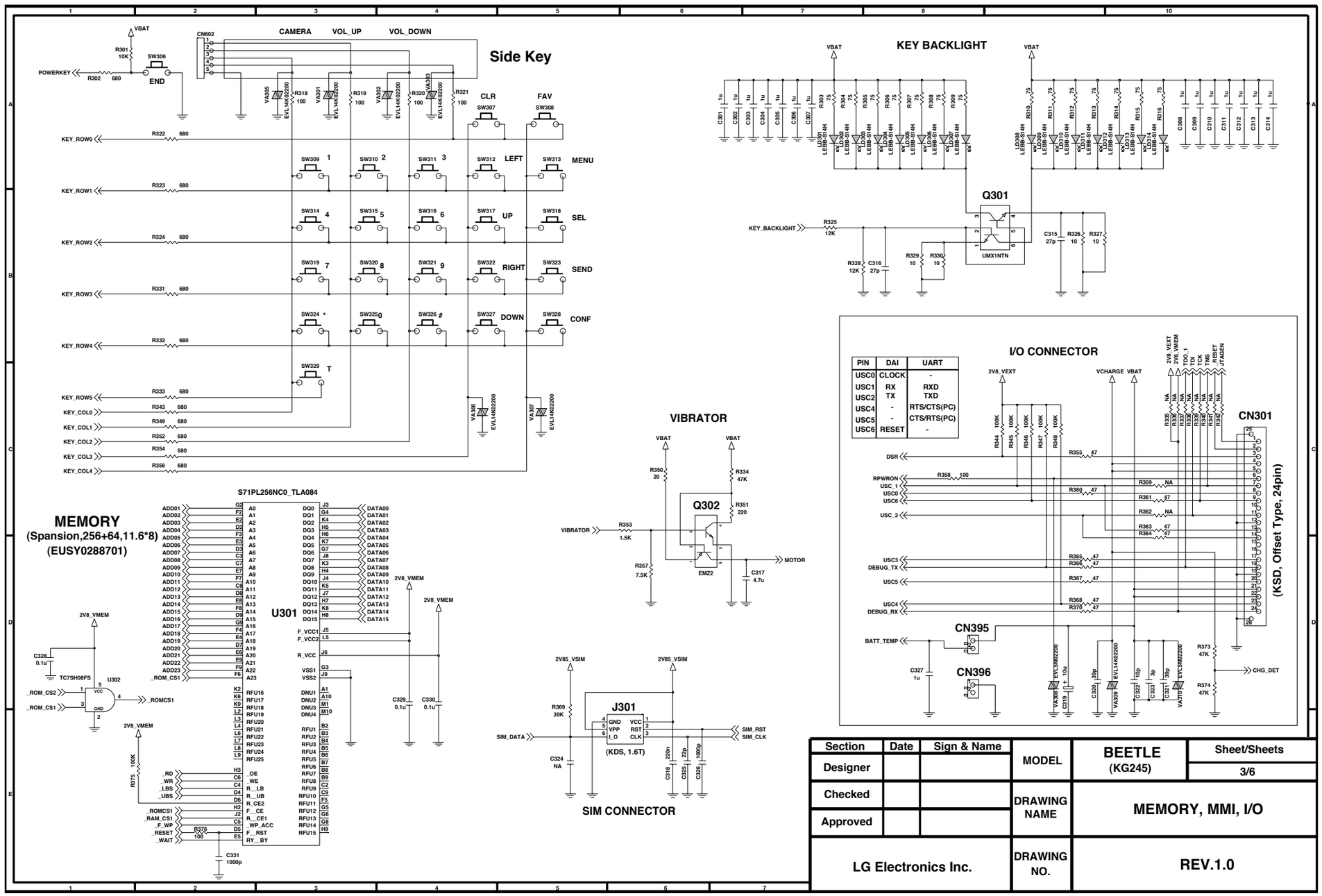



| Section | Date | Sign & Name | MODEL | BEETLE (KG245) | Sheet/Sheets |
|---|---|---|---|---|---|
| Designer | | | | | 2/6 |
| Checked | | | DRAWING NAME | AUDIO / BLUETOOTH / PRECHARGE | |
| Approved | | | | | |
| Iss. | Notice No. | Date / Name | LG Electronics Inc. | DRAWING NO. | REV.1.0 |

LGIC(42)-A-5505-10:01

LG Electronics Inc.

# 7. CIRCUIT DIAGRAM



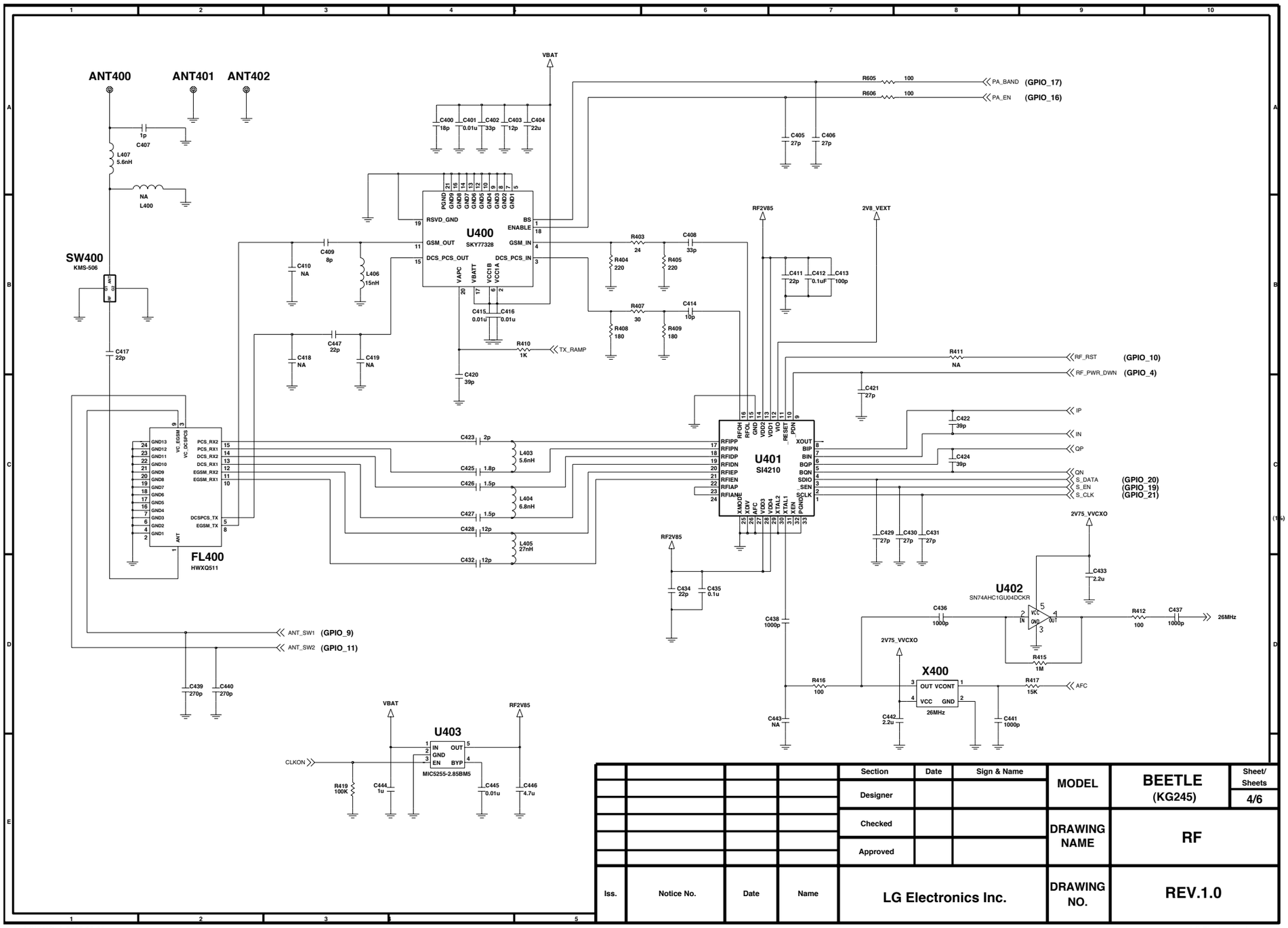

| PIN | DAI | UART |
|---|---|---|
| USC0 | CLOCK | - |
| USC1 | RX | RXD |
| USC2 | TX | TXD |
| USC4 | - | RTS/CTS(PC) |
| USC5 | - | CTS/RTS(PC) |
| USC6 | RESET | - |

| Section | Date | Sign & Name | MODEL | BEETLE (KG245) | Sheet/Sheets |
|---|---|---|---|---|---|
| Designer | | | | | 3/6 |
| Checked | | | DRAWING NAME | MEMORY, MMI, I/O | |
| Approved | | | | | |
| LG Electronics Inc. | | | DRAWING NO. | REV.1.0 | |

LGIC(42)-A-5505-10:01

LG Electronics Inc.

# 7. CIRCUIT DIAGRAM

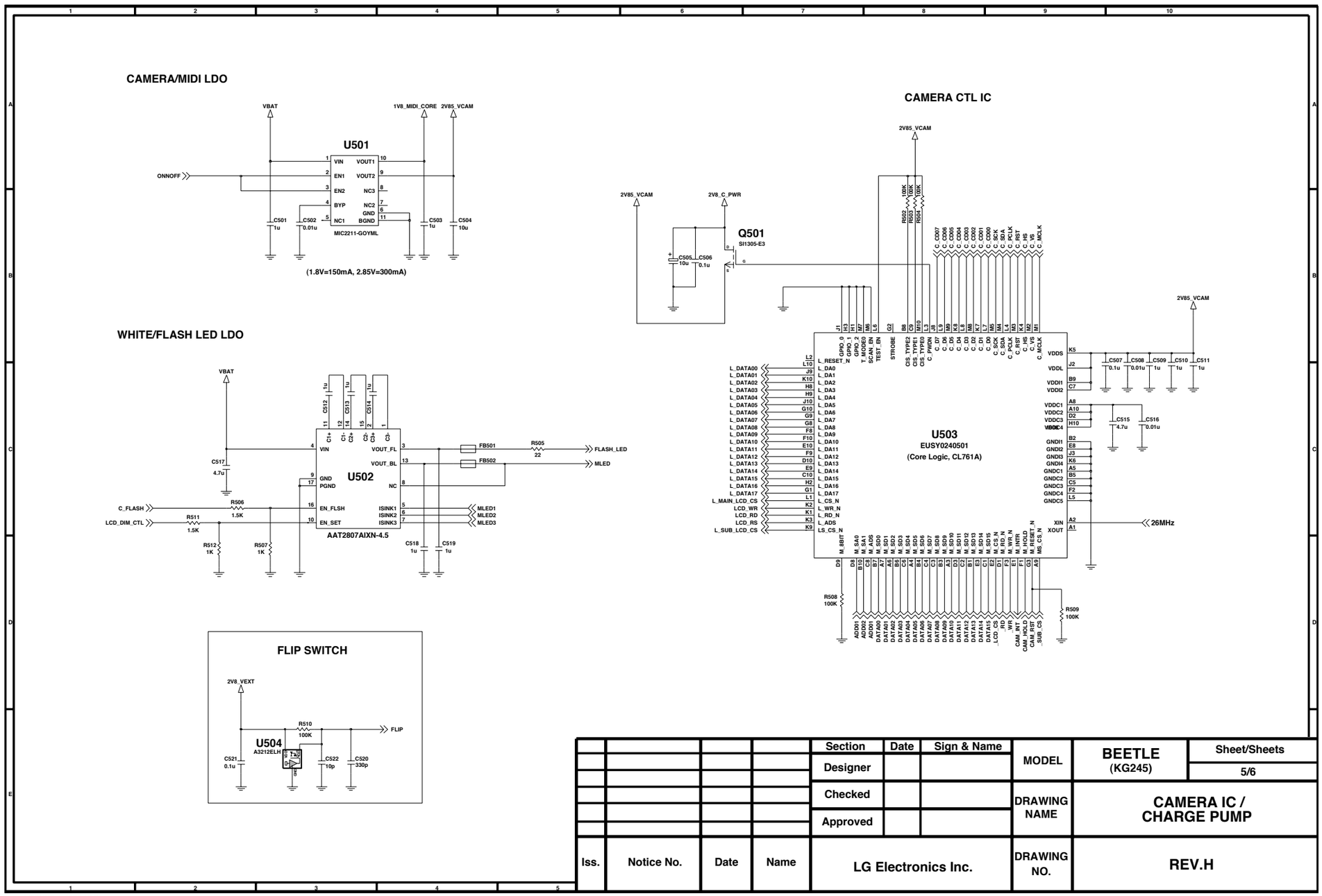



| | | | | Section | Date | Sign & Name | MODEL | BEETLE (KG245) | Sheet/ Sheets |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Designer | | | | | 4/6 |
| | | | | Checked | | | DRAWING NAME | RF | |
| | | | | Approved | | | | | |
| Iss. | Notice No. | Date | Name | LG Electronics Inc. | | | DRAWING NO. | REV.1.0 | |

LGIC(42)-A-5505-10:01

LG Electronics Inc.

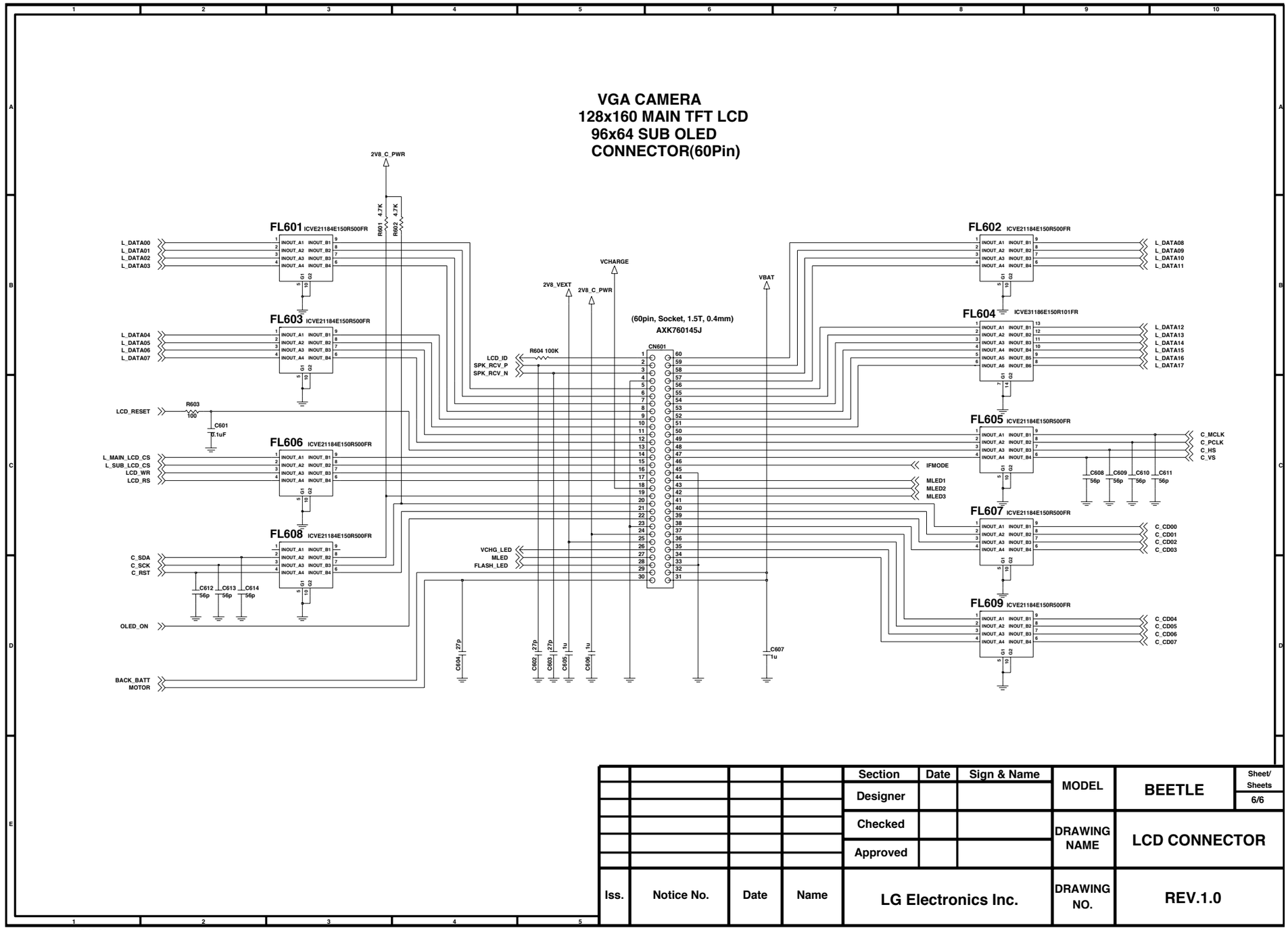
# 7. CIRCUIT DIAGRAM




LGIC(42)-A-5505-10:01

LG Electronics Inc.

# 7. CIRCUIT DIAGRAM

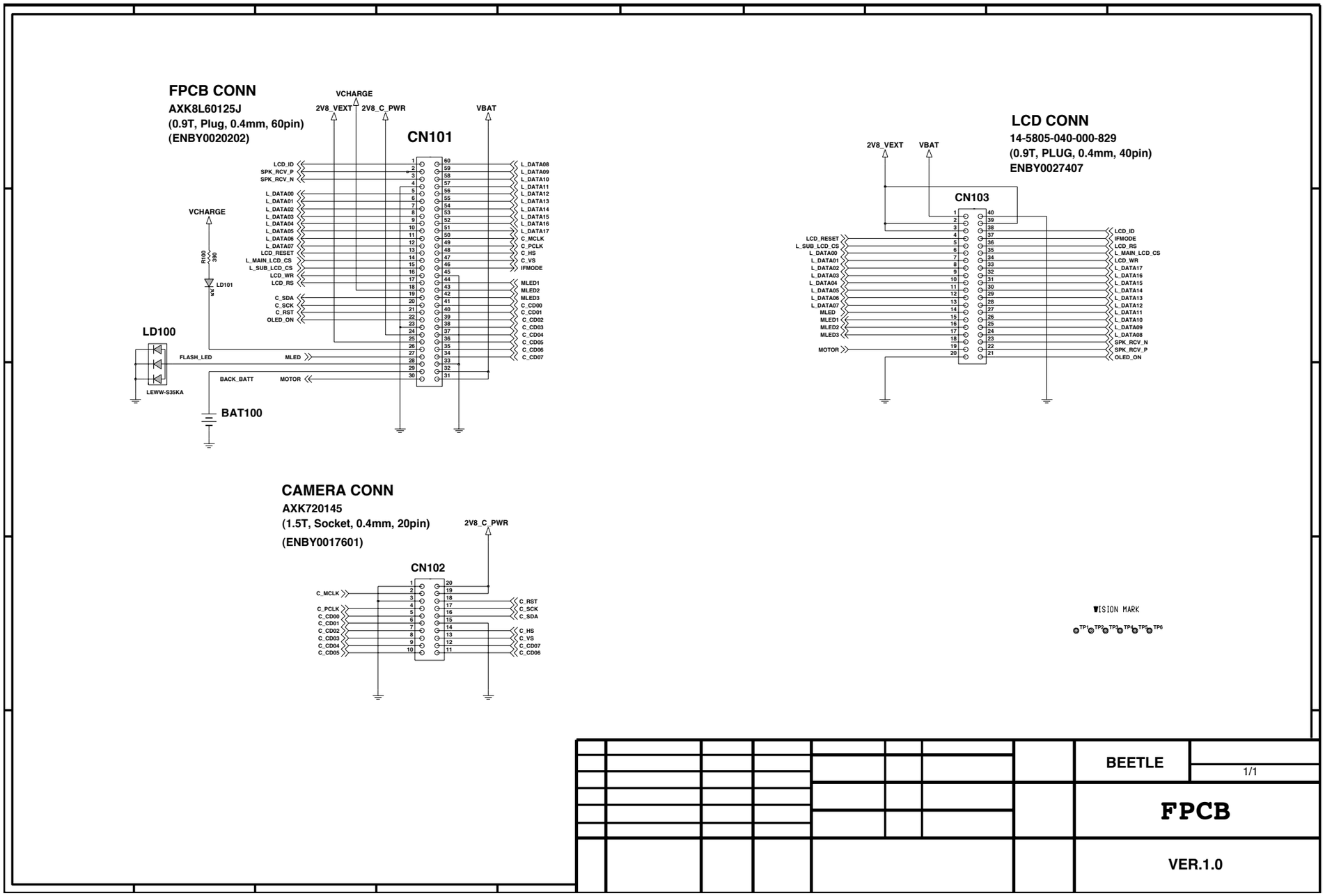



| | | | | Section | Date | Sign & Name | MODEL | BEETLE | Sheet/ Sheets |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Designer | | | | | 6/6 |
| | | | | Checked | | | DRAWING NAME | LCD CONNECTOR | |
| | | | | Approved | | | | | |
| Iss. | Notice No. | Date | Name | LG Electronics Inc. | | | DRAWING NO. | REV.1.0 | |

LGIC(42)-A-5505-10:01

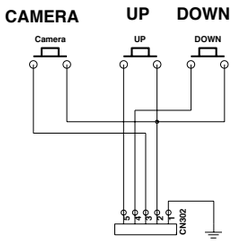
LG Electronics Inc.

# 7. CIRCUIT DIAGRAM



# 7. CIRCUIT DIAGRAM

SIDE KEY



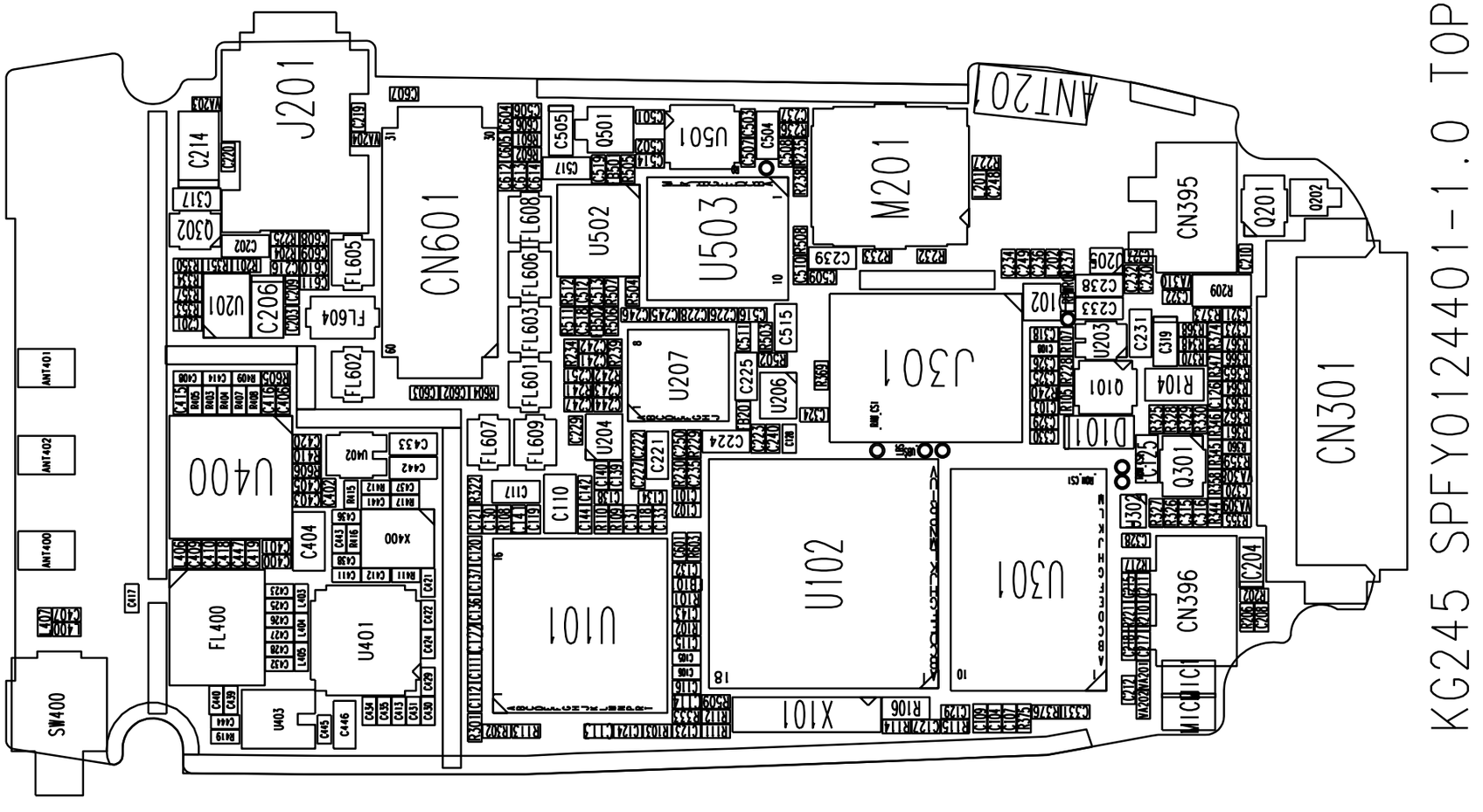

1 -> GND
2 -> KEY_COL0
3 -> KEY_COL1
4 -> KEY_COL2
5 -> KEY_ROW0

| | | | | Section | Date | Sign & Name | MODEL | M6100 SIDE | Sheet/ Sheets |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Designer | 08/06 2005 | | | | 1/1 |
| | | | | Checked | | | DRAWING NAME | CAM_VOLUME_SIDEKEY_FPCB | |
| | | | | Approved | | | | | |
| Iss. | Notice No. | Date | Name | LG Electronics Inc. | | | DRAWING NO. | Ver C | |

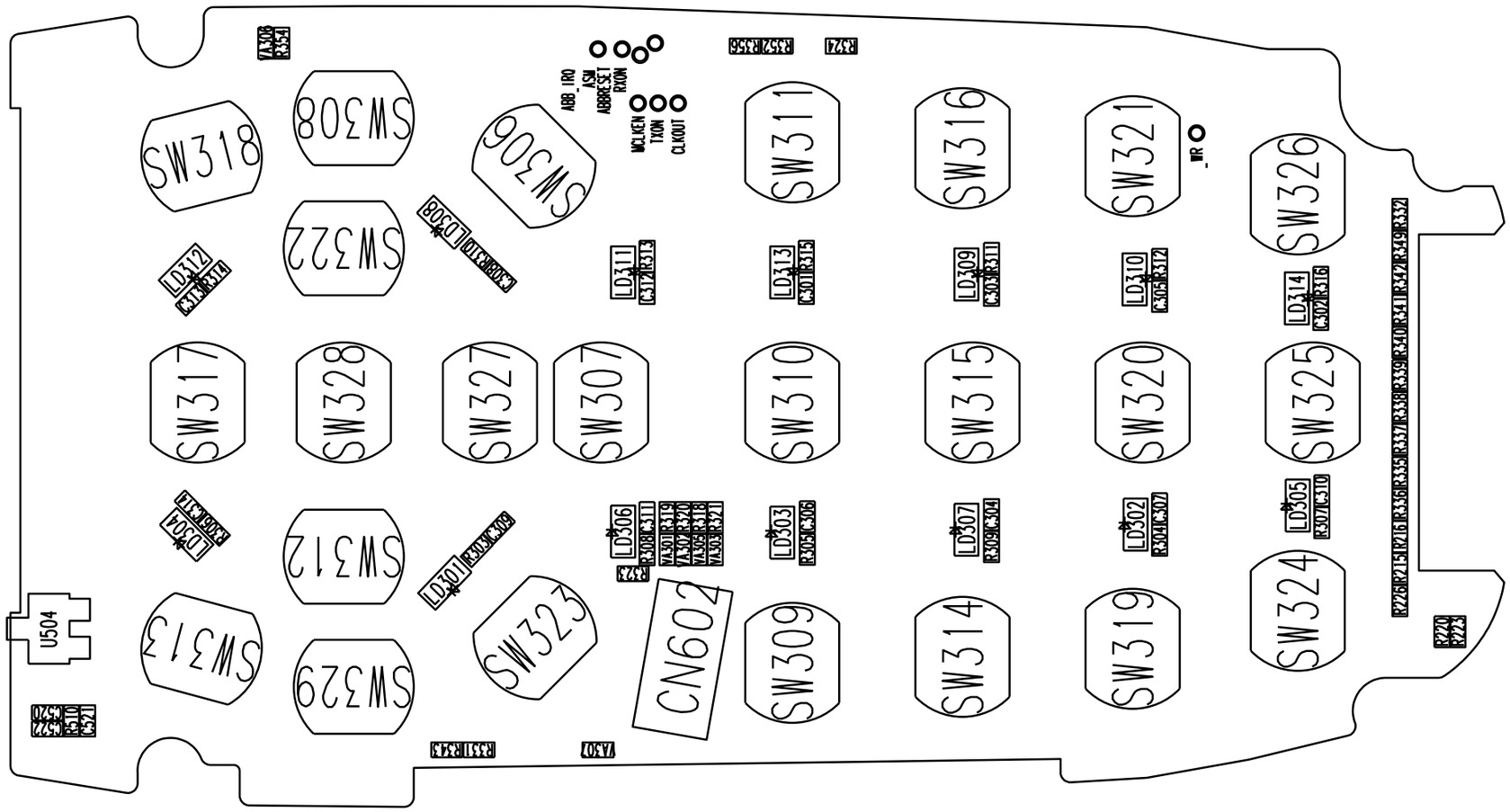
LGIC(42)-A-5505-10:01

LG Electronics Inc.

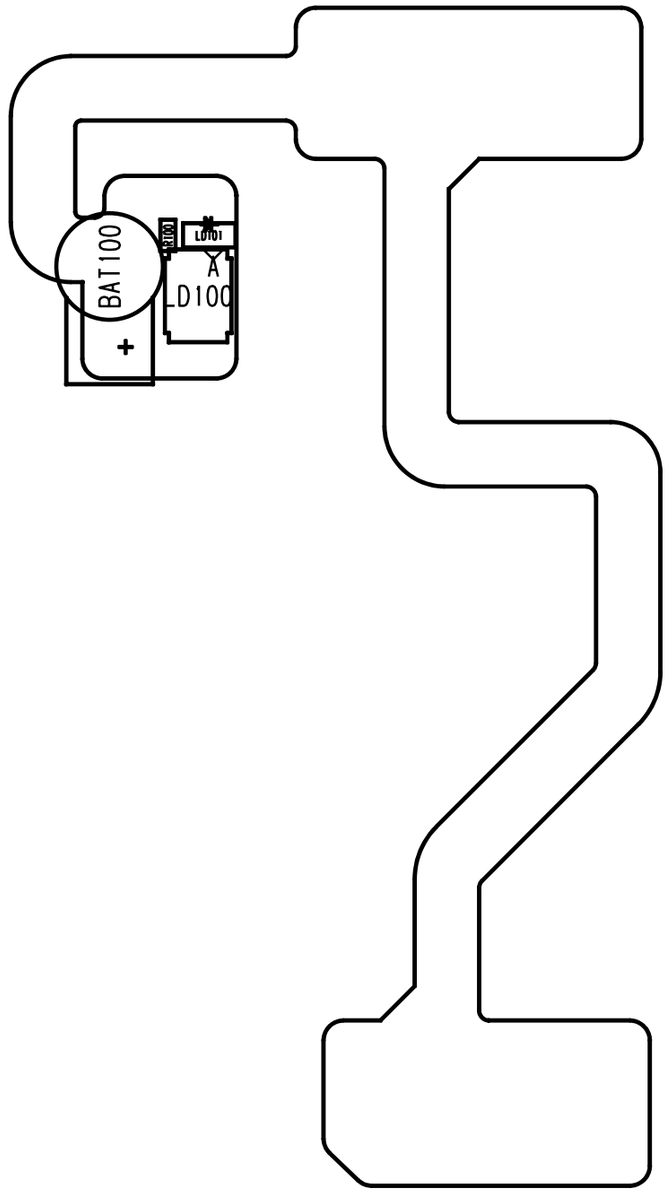
## 8. PCB LAYOUT


KG245 SPFY012440 1-1.0 TOP
J201
CN601
U502
U503
M201
U501
ANT201
CN395
Q201
Q202
U400
U101
U102
U301
CN301
CN396
FL400
U401
SW400
X101
U207
U206
U204
U203
Q301
Q101
D101
R104
R106
C206
C214
C404
C110
C515
C225
C221
C224
C239
C233
C238
C231
C319
C204
C125
R209
R102
Q0209
Q0302
U201
U402
U403
X400
FL601
FL602
FL603
FL604
FL605
FL606
FL607
FL609
ANT401
ANT402
ANT400
WIC1IC1

# 8. PCB LAYOUT

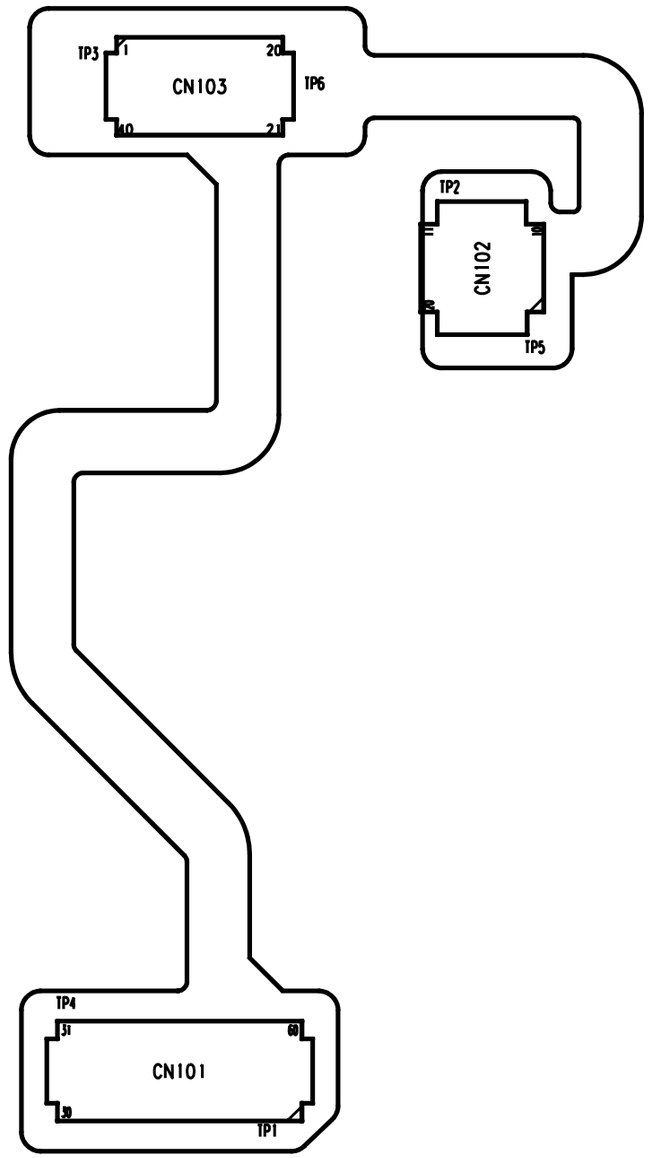

SW318
SW308
SW306
SW322
SW311
SW316
SW321
SW326
SW317
SW328
SW327
SW307
SW310
SW315
SW320
SW325
SW312
SW313
SW329
SW323
CN602
SW309
SW314
SW319
SW324
U504
LD312
LD311
LD313
LD309
LD310
LD314
LD304
LD306
LD303
LD307
LD302
LD305
LD301
ABB_IRQ
ASN
ABBRESET
RXON
MCLKEN
TXON
CLKOUT
_MR
KG245 SPFY012440 1-1.0 BTM

## 8. PCB LAYOUT




KG245-SPCY0072401-1.0-TOP

# 8. PCB LAYOUT




KG245-SPCY0072401-1.0-BOTTOM

# 9. ENGINEERING MODE

## A. About Engineering Mode

Engineering mode is designed to allow a service man/engineer to view and test the basic functions provided by a handset.

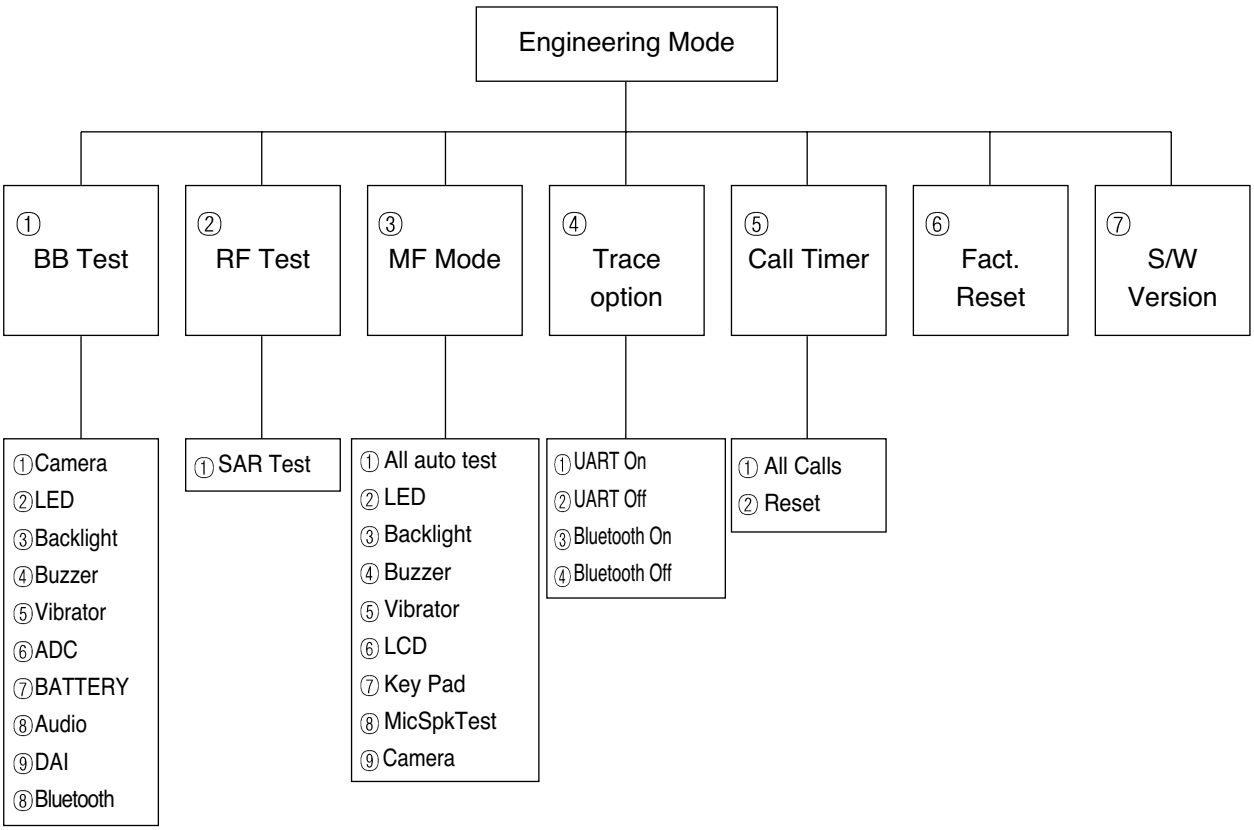
## B. Access Codes

The key sequence for switching the engineering mode on is 2945#*#. Pressing END will switch back to non-engineering mode operation.

## C. Key Operation

Use Up and Down key to select a menu and press ‘select’ key to progress the test. Pressing ‘back’ key will switch back to the original test menu.

## D. Engineering Mode Menu Tree



# 9.1 BB Test [MENU 1]

## 9.1.1 Camera

1) Main LCD preview : This menu is to test Camera preview on Main LCD screen.
2) Sub LCD Preview : This menu is to test Camera preview on Sub LCD screen.
3) Flash on : This menu is to test Folder Flash light.
   - Select this menu if you want to turn on folder flash light.
4) Flash off : This menu is to test Folder Flash light.
   - Select this menu if you want to turn off folder flash light.

## 9.1.2 Backlight

This menu is to test the LCD Backlight and Keypad Backlight.
1) Backlight on : LCD Backlight and Keypad Backlight light on at the same time.
2) Backlight off : LCD Backlight and Keypad Backlight light off at the same time.
3) Backlight value : This controls brightness of Backlight. When entering into the menu, the present backlight-value in the phone is displayed. Use Left/Right key to adjust the level of brightness. The value of the brightness set at last will be saved in the NVRAM.

## 9.1.3 Buzzer

This menu is to test the melody sound.
1) Melody on : Melody sound is played through the speaker.
2) Melody off : Melody sound is off.

## 9.1.4 Vibrator

This menu is to test the vibration mode.
1) Vibrator on : Vibration mode is on.
2) Vibrator off : Vibration mode is off.

### 9.1.5 ADC (Analog to Digital Converter)

This displays the value of each ADC.
1) MVBAT ADC : Main Voltage Battery ADC
2) AUX ADC : Auxiliary ADC
3) TEMPER ADC : Temperature ADC

### 9.1.6 BATTERY

1) Bat Cal : This displays the value of Battery Calibration. The following menus are displayed in order :
BAT_LEV_4V, BAT_LEV_3_LIMIT, BAT_LEV_2_LIMIT, BAT_LEV_1_LIMIT,
BAT_IDLE_LI MIT, BAT_INCALL_LIMIT, SHUT_DOWN_VOLTAGE,
BAT_RECHARGE_LMT
2) TEMP Cal : This displays the value of Temperature Calibration.
The following menus are displayed in order : TEMP_HIGH_LIMIT,
TEMP_HIGH_RECHARGE_LMT, TEMP_LOW_RECHARGE_LMT, TEMP_LOW_LIMIT

### 9.1.7 Audio

This is a menu for setting the control register of Voiceband Baseband Codec chip.
Although the actual value can be written over, it returns to default value after switching off and on the phone.
1) VbControl1 : VbControl1 bit Register Value Setting
2) VbControl2 : VbControl2 bit Register Value Setting
3) VbControl3 : VbControl3 bit Register Value Setting
4) VbControl4 : VbControl4 bit Register Value Setting
5) VbControl5 : VbControl5 bit Register Value Setting
6) VbControl6 : VbControl6 bit Register Value Setting

### 9.1.8 DAI (Digital Audio Interface)

This menu is to set the Digital Audio Interface Mode for Speech Transcoder and Acoustic testing.
1) DAI AUDIO : DAI audio mode
2) DAI UPLINK : Speech encoder test
3) DAI DOWNLINK : Speech decoder test
4) DAI OFF : DAI mode off

## 9.2 RF Test [MENU 2]

### 9.2.1 SAR test

This menu is to test the Specific Absorption Rate.
1) SAR test on : Phone continuously process TX only. Call-setup equipment is not required.
2) SAR test off : TX process off

## 9.3 MF mode [MENU 3]

This manufacturing mode is designed to do the baseband test automatically. Selecting this menu will process the test automatically, and phone displays the previous menu after completing the test.

### 9.3.1 All auto test

LCD, Backlight, Vibrator, Buzzer, Key Pad, Mic&Speaker,

### 9.3.2 Backlight

LCD Backlight is on for about 1.5 seconds at the same time, then off.

### 9.3.3 Buzzer

This menu is to test the volume of Melody. It rings in the following sequence. Volume 1, Volume 2, Volume 3, Volume 0 (mute), Volume 4, Volume 5.

### 9.3.4 Vibrator

Vibrator is on for about 1.5 seconds.

### 9.3.5 LCD

1)LCD
Main LCD screen resolution tests horizontally and vertically one by one and fills the screen.
2)SubLCD
Sub LCD screen resolution tests horizontally and vertically one by one and fills the screen.

### 9.3.6 Key pad

When a pop-up message shows ‘Press Any Key’, you may press any keys including side keys, but not [Soft2 Key]. If the key is working properly, name of the key is displayed on the screen. Test will be completed in 15 seconds automatically.

### 9.3.7 MicSpk Test

The sound from MIC is recorded for about 3 seconds, then it is replayed on the speaker automatically.

### 9.3.8 Camera

Camera preview function is activated on Main LCD screen.

## 9.4 Trace option [MENU 4]

This is NOT a necessary menu to be used by neither engineers nor users.

## 9.5 Call timer [MENU 5]

This menu is to set the Digital Audio Interface Mode for Speech Transcoder and Acoustic testing.
1) All calls : This displays total conversation time. User cannot reset this value.
2) Reset settings : This resets total conversation time to this, [00:00:00].
3) DAI DOWNLINK : Speech decoder test
4) DAI OFF : DAI mode off

## 9.6 Fact. Reset [MENU 6]

This Factory Reset menu is to format data block in the flash memory and this procedure set up the default value in data block.

**Attention**
① Fact. Reset (i.e.Factory Reset) should be only used during the Manufacturing process.
② Servicemen should NOT progress this menu, otherwise some of valuable data such as Setting value, RF Calibration data, etc. cannot be restored again.

## 9.7 S/W version[MENU 7]

This displays software version stored in the phone.

# 10. STAND ALONE TEST

## 10.1 Introduction

This manual explains how to examine the status of RX and TX of the model.

### A. Tx Test

TX test - this is to see if the transmitter of the phones is activating normally.

### B. Rx Test

RX test - this is to see if the receiver of the phones is activating normally.

## 10.2 Setting Method

### A. COM port

a. Move your mouse on the “Connect” button, then click the right button of the mouse and select “Com setting”.
b. In the “Dialog Menu”, select the values as explained below.
- Port : select a correct COM port
- Baud rate : 38400
- Leave the rest as default values

### B. Tx

**1. Selecting Channel**
- Select one of GSM or DCS Band and input appropriate channel.

**2. Selecting APC**
a. Select either Power level or Scaling Factor.
b. Power level
- Input appropriate value GSM (between 5~19) or DCS (between 0~15)

c. Scaling Factor
- A ‘Ramp Factor’ appears on the screen.
- You may adjust the shape of the Ramp or directly input the values.

### C. Rx

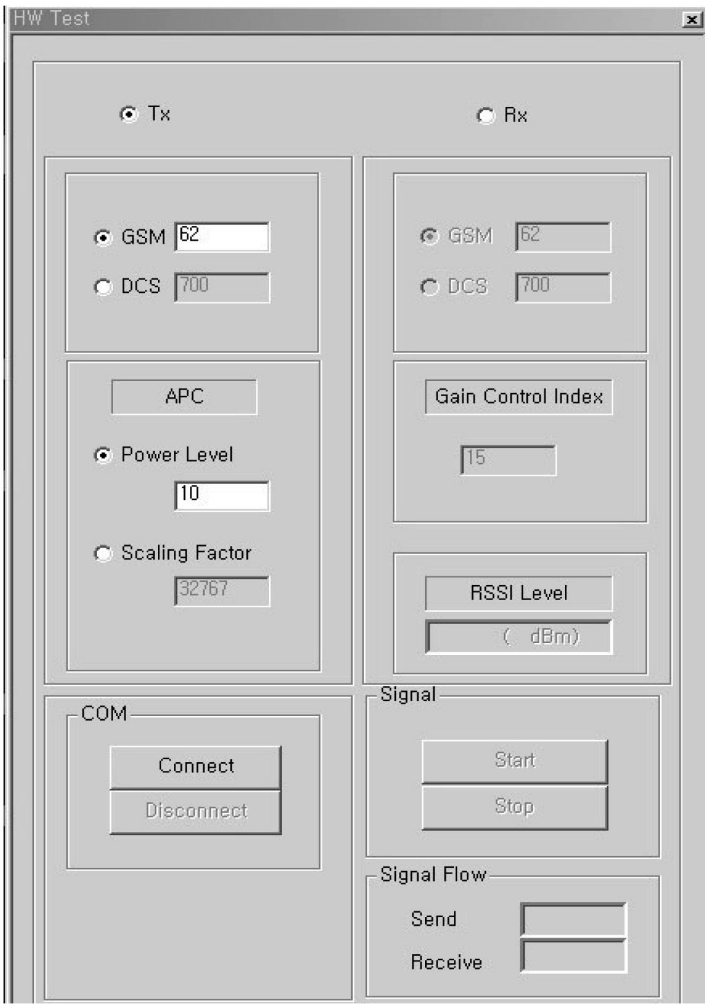
**1. Selecting Channel**
- Select one of GSM or DCS Band and input appropriate channel.

**2. Gain Control Index (0~ 26) and RSSI level**
- See if the value of RSSI is close to -16dBm when setting the value between 0 ~ 26 in Gain Control Index.
- Normal phone should indicate the value of RSSI close to -16dBm.

## 10.3 Means of Test

a. Select a COM port
b. Set the values in Tx or Rx
c. Select band and channel
d. After setting them all above, press connect button.
e. Press the start button

**Figure 10-1. HW test program**



# 10. STAND ALONE TEST

**Figure 10-2. HW test setting**

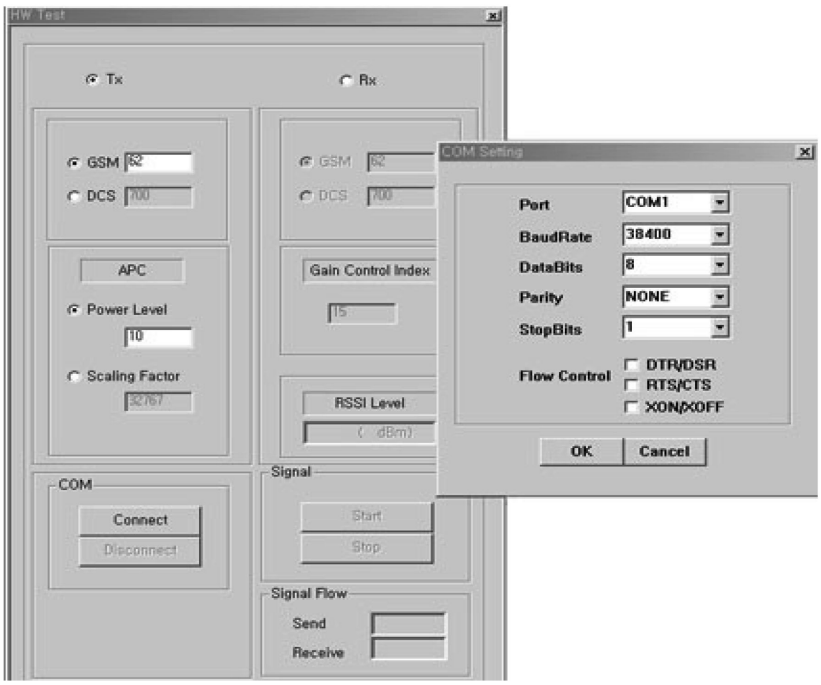
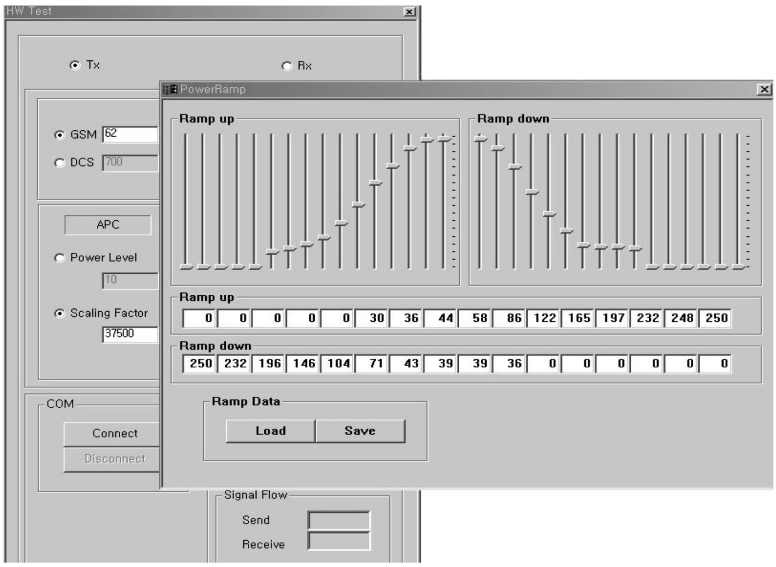



**Figure 10-3. Ramping profile**



# 11. AUTO CALIBRATION

## 11.1 Overview

Autocal (Auto Calibration) is the PC side Calibration tool that perform Tx ,Rx and Battery Calibration with Agilent 8960(GSM call setting instrument) and Tektronix PS2521G(Programmable Power supply). Autocal generate calibration data by communicating with phone and measuring equipment then write it into calibration data block of flash memory in GSM phone.

## 11.2 Requirements

-PC or Notebook installed with Microsoft Windows 98/ME/2000/XP
-Auto Calibration program(Autocal.exe)
-GSM Phone
-LGE PIF JIG, Serial Cable, Data Cable
-Agilent 8960(Call Setting Instrument)
-Tektronix PS2521G(Programmable Power Supply)

## 11.3 Menu and Settings

-File(F) Clear View : Clear Calibration Status window texts
-File(F) Save View : Save Calibration Status window texts
-File(F) Save Setting : Save Current Calibration settings to setting file(*.cal)
-File(F) Load Setting : Load saved Calibration setting
-File(F) Make BIN ALL : Make binary file after calibration finished
-File(F) Make BIN BAT.Cal only : Make binary file of battery cal data only after calibration finished
-File(F) Make & Write BIN : Make binary file after calibration finished then download it to the Flash Memory
-View(V) Tools : Enable or disable Tool bar
-View(V) Status : Enable or disable status bar
-Connection(C) Connect : Connect the phone with PC. This procedure checks whether the PC is connected “ag8960” or not. After that it performs sync. procedure with phone. If the sync. procedure is successful state column on status bar changed to SETUP, else you should disconnect phone and try again from the beginning and also check the whole connection. All measurement is performed at state SETUP.
-Connection(C) Port Setting : Show COM port setting dialog and Baudrate you can change,etc.
-GPIB(G) Connect : Connect the Ag8960 GPIB card with PC.

# 11. AUTO CALIBRATION

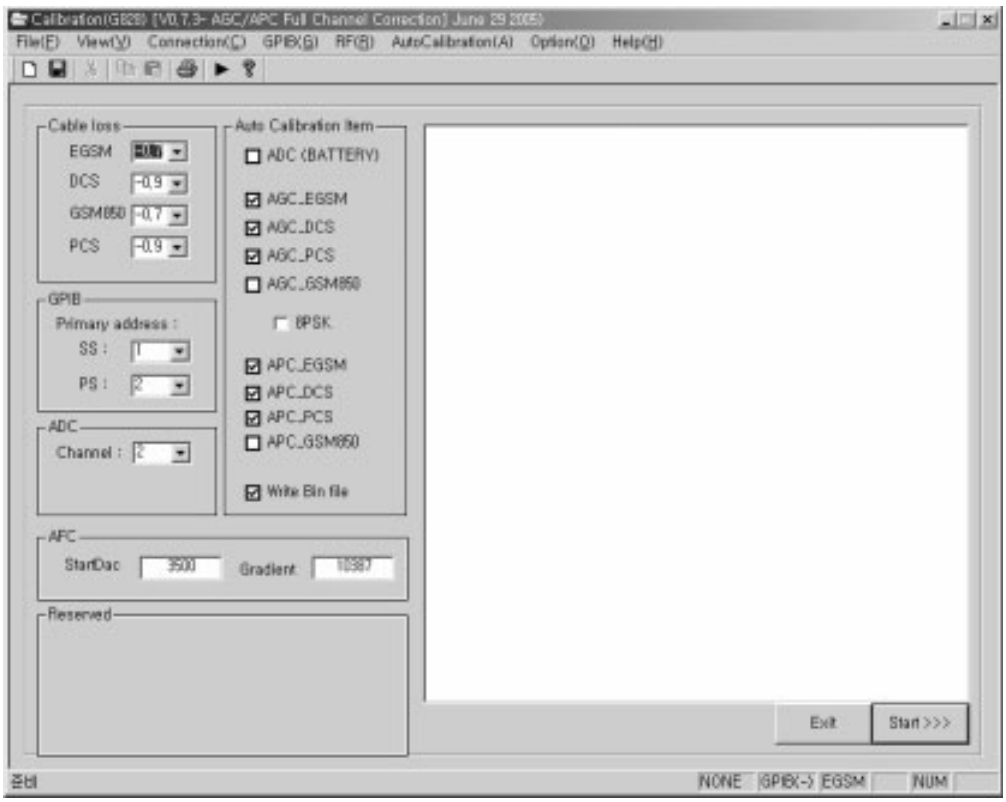



**Figure 11-1. Auto Calibration Program**

Screen → Cable loss : Enter the RF cable loss GSM and DCS
Screen → GPIB(Primary address) : Enter the SS(Ag8960) and PS(Tektronix PS2521G) GPIB address
Screen → ADC Channel : Default ADC Calibration Channel
Screen → Auto Calibration Item : Default Calibration Settings about Tx, Rx, ADC and write BIN file

## 11.4 AGC

This procedure is for Rx calibration.
In this procedure, We can get RSSI correction value. Set band EGSM and press Start button theresult window will show correction values per every power level and gain code and the samemeasure is performed per every frequency.

## 11.5 APC

This procedure is for Tx calibration.
In this procedure you can get proper scale factor value and measured power level.

## 11.6 ADC

This procedure is for battery calibration.
You can get main Battery Config Table and temperature Config Table

## 11.7 Setting

check com port and cable loss. Select automatic calibration item. If you uncheck one item calibration will stop from the unchecked item. This is useful when you want to process only one item.

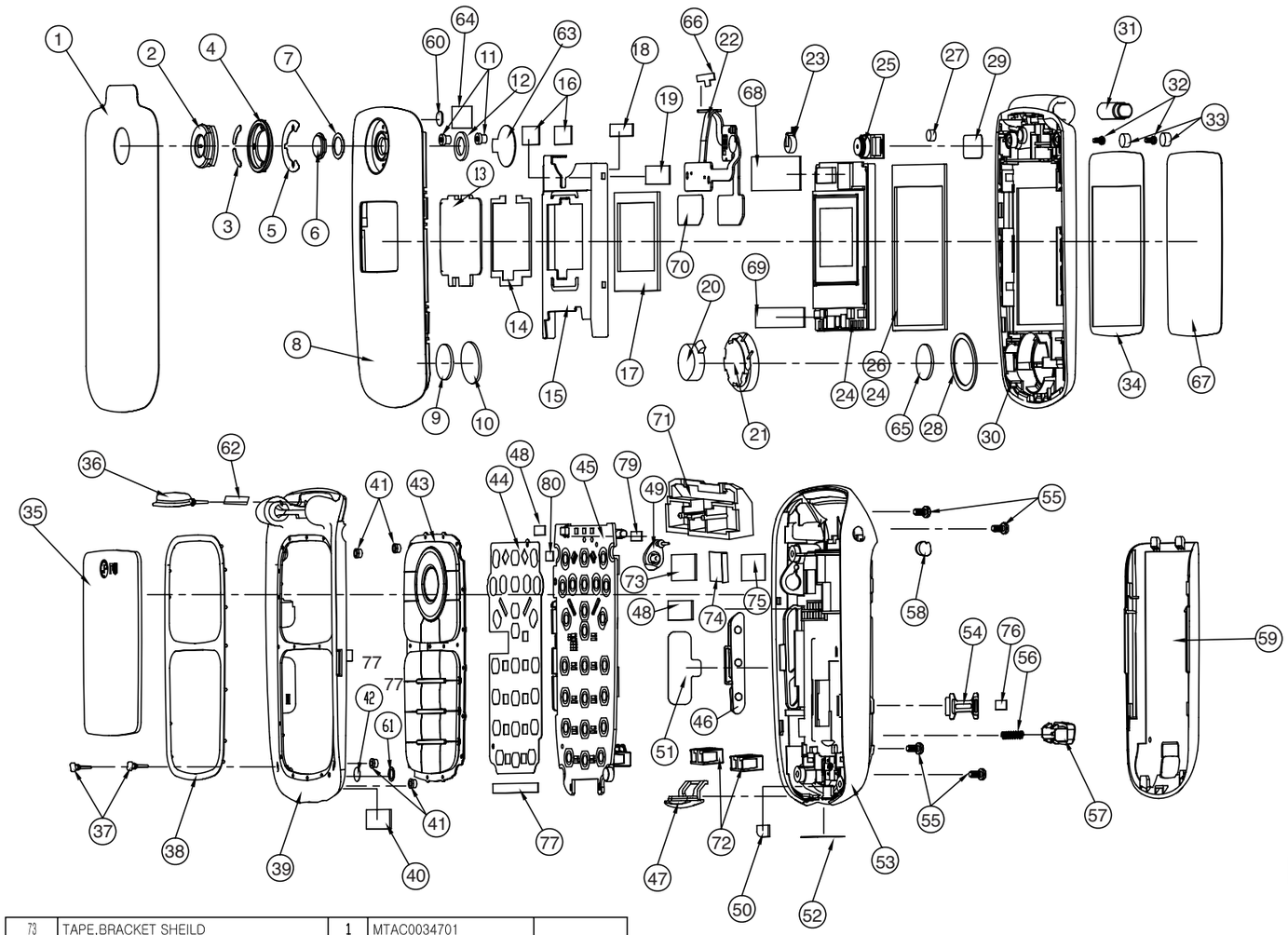
## 11.8 How to do calibration

A. Connect cable between phone and serial port of PC.
B. Connect Ag8960 equipment and Power Supply and phone.
C. Set correct port and baud rate.
D. Press Start button. AutoCal process all calibration procedure
i. AGC EGSM
ii. AGC DCS
iii. APC EGSM
iv. APC DCS
v. ADC
E. After finished all measurement. The state is return to SETUP.
F. The Cal file will be generated and then the calibration data will be written into phone and then will be reset.

# 12. EXPLODED VIEW & REPLACEMENT PART LIST

## 12.1 EXPLODED VIEW

| | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 62 | TAPE,STPPER HINGE | 1 | MTAZ0132001 | | 51 | TAPE, PROTECTION(SIDE_KEY) | 1 | MTAB0100601 | | 50 | PAD, MIC | 1 | MPBH0020701 | |
| 63 | TAPE,PROTECTION(CAMERA) | 1 | MTAB0112801 | | 52 | TAPE, PROTECTION(CAP_RECEPTALE) | 1 | MTAB0100501 | | 49 | CAP, EARPHONE JACK | 1 | MCCC0033201 | |
| 64 | INSULATOR,BACK-UP | 1 | MIDZ0090801 | | 53 | COVER, REAR | 1 | MCJN0050401 | | 48 | GASKET, SHIELD FOAM(BTOB CONN) | 1 | MGAD0107801 | |
| 65 | PAD,MOTOR | 1 | MPBJ0031201 | | 54 | LOCKER, SIM | 1 | MLEY0001901 | | 47 | CAP, RECEPTALE | 1 | MCCE0026501 | |
| 66 | PAD,FPCB | 1 | MPBF0014701 | | 55 | SCREW, MACHINE(1.4*3.0) | 4 | GMEY0002001 | | 46 | BUTTON, SIDE | 1 | MBJL0030101 | |
| 67 | TAPE,PROTECTION(LCD MAIN) | 1 | MTAB0101401 | | 56 | SPRING | 1 | MSDZ0002001 | | 45 | PCB ASSY, MAIN | 1 | SAFY0156501 | |
| 68 | INSULATOR,LCD-1 | 1 | MIDA0019601 | | 57 | LOCKER, BATTERY | 1 | MLEA0029001 | | 44 | DOME ASSY, METAL | 1 | ADCA0048001 | |
| 69 | INSULATOR,LCD-2 | 1 | MIDA0019701 | | 58 | CAP, MOBILE SWITCH | 1 | MCCF0033201 | | 43 | KEYPAD | 1 | MKAZ0027401 | |
| 70 | GASKET,SHIELD TAPE | 1 | MGAZ0028601 | | 59 | COVER, BATTERY | 1 | MCJA0029701 | | 42 | FILTER, MIC | 1 | MFBD0014101 | |
| 71 | INTENNA | 1 | SNGF0008801 | | 60 | PAD, BATTERY | 1 | MIDZ0090801 | | 41 | INSERT | 4 | MICA0020201 | |
| 72 | BAT,CON | 1 | ENZY0013201 | | 61 | PAD, MIC | 1 | MPBZ0132001 | | 40 | GASKET, SHIELD FOAM(FRONT) | 1 | MGAD0111401 | |
| | | | | | | | | | | 39 | COVER, FRONT | 1 | MCJK0054801 | |
| | | | | | | | | | | 38 | DECO, FRONT | 1 | MDAG0017701 | |
| | | | | | | | | | | 37 | BUMPER | 2 | MBHY0018201 | |
| | | | | | | | | | | 36 | STOPPER, HINGE | 1 | MSGB0013301 | |
| | | | | | | | | | | 35 | WINDOW, LCD(MAIN) | 1 | MWAC0063401 | |
| | | | | | | | | | | 34 | TAPE, WINDOW(MAIN) | 1 | MTAD0049301 | |
| | | | | | | | | | | 33 | CAP, SEREW | 2 | MCCH0074601 | |
| | | | | | | | | | | 32 | SCREW, MACHINE(1.4*3.0) | 2 | GMEY0002001 | |
| | | | | | | | | | | 31 | HINGE,FOLDER | 1 | MHFD0011801 | |
| | | | | | | | | | | 30 | COVER, FOLDER (LOWER) | 1 | MCJH0033401 | |
| | | | | | | | | | | 29 | TAPE, CAMERA | 1 | MTAZ0113001 | |
| | | | | | | | | | | 28 | FILTER, SPEAKER | 1 | MFBC0021301 | |
| | | | | | | | | | | 27 | MAGNET, SWITCH | 1 | MMAA0000601 | |
| | | | | | | | | | | 26 | PAD, LCD(MAIN) | 1 | MPBG0043701 | |
| | | | | | | | | | | 25 | CAMERA, MODULE | 1 | SVCY0009501 | |
| | | | | | | | | | | 24 | LDC, MODULE | 1 | SVLM0017801 | |
| | | | | | | | | | | 23 | BATTERY, CELL LITHUM | 1 | ********* | |
| | | | | | | | | | | 22 | PCB ASSY, FLEXIBLE | 1 | SPCY0042001 | |
| | | | | | | | | | | 21 | SPEAKER | 1 | SUSY0015501 | |
| | | | | | | | | | | 20 | VIBRATOR, MOTOR | 1 | SJMY0006503 | |
| | | | | | | | | | | 19 | PAD, CONN | 1 | MPBZ0136101 | |
| | | | | | | | | | | 18 | GASKET, SHIELD FOAM(CON1) | 1 | MGAD0111501 | |
| | | | | | | | | | | 17 | PAD, LCD(SUB) | 1 | MPBQ0027201 | |
| | | | | | | | | | | 16 | GASKET, SHIELD FOAM(CON2) | 2 | MGAD0107701 | |
| | | | | | | | | | | 15 | BRACKET, LCD | 1 | MBFF0008401 | |
| | | | | | | | | | | 14 | TAPE, WINDOW(SUB) | 1 | MTAE0026801 | |
| | | | | | | | | | | 13 | WINDOW ASSY, LCD(SUB) | 1 | AWAB0063401 | |
| | | | | | | | | | | 12 | PAD, CAMERA | 1 | MPBT0026301 | |
| | | | | | | | | | | 11 | INSERT | 2 | MICC0010601 | |
| | | | | | | | | | | 10 | PAD, SPEAKER | 1 | MPBN0028101 | |
| | | | | | | | | | | 9 | PAD, MOTOR | 1 | MPBJ0031001 | |
| | | | | | | | | | | 8 | COVER, FOLDER (UPPER) | 1 | MCJJ0041101 | |
| | | | | | | | | | | 7 | TAPE, WINDOW(CAMERA) | 1 | MTAD0049201 | |
| | | | | | | | | | | 6 | WINDOW, CAMERA | 1 | MWAE0015001 | |
| | | | | | | | | | | 5 | TAPE, DECO(CAMERA) | 1 | MTAA0110001 | |
| | | | | | | | | | | 4 | DECO, CAMERA | 1 | MDAY0024701 | |
| | | | | | | | | | | 3 | TAPE, DECO(FLASH) | 1 | MTAA0109901 | |
| | | | | | | | | | | 2 | DECO, FLASH | 1 | MDAY0024701 | |
| | | | | | | | | | | 1 | TAPE, PROTECTION(UPPER) | 1 | MCJJ0041101 | |
| | | | | | | | | | | NO. | DESCRIPTION | Q'TY | DRAWING NO. | REMARK |



| | | | | |
|---|---|---|---|---|
| 73 | TAPE,BRACKET SHEILD | 1 | MTAC0034701 | |
| 74 | PAD,BRACKET SHEILD | 1 | MPBZ0122701 | |
| 75 | BRACKET, SHIELD | 1 | MBFZ0024801 | |
| 76 | GASCKET,SHIELD TAPE | 1 | MGAZ0030501 | |
| 77 | INSULATOR,PCB | 1 | MIDZ0085001 | |
| 78 | INSULATOR,PCB(TOP1) | 1 | MIDZ0086601 | |
| 79 | GASCKET,SHIELD TAPE | 1 | MGAZ0029801 | |
| 80 | INSULATOR,PCB-2 | 1 | MIDZ0096801 | |
| | | | | |

| DESCRIPTION | NO. |
|---|---|
| COVER_ASSY REAR | 46,47,48,49,50,51,52,53,54,56,57 |
| COVER_ASSY FRONT | 36,37,38,39,40,41,42 |
| COVER_ASSY LOWER | 26,27,28,29,30,32,34,35 |
| COVER_ASSY UPPER | 1,2,3,4,5,6,7,8,9,10,11,12,60 |

## 12.2 Replacement Parts <Mechanic component>

**Note:** This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

| Level | Location No. | Description | Part Number | Specification | Color | Remark |
|---|---|---|---|---|---|---|
| 1 | | GSM(FOLDER) | TGFF0087301 | KG241 TMD | Black | |
| 2 | AAAY00 | ADDITION | AAAY0142201 | | Black | |
| 3 | MCJA00 | COVER,BATTERY | MCJA0029701 | | Dark Silver | |
| 2 | APEY00 | PHONE | APEY0265001 | | Dark Silver | |
| 3 | ACGG00 | COVER ASSY,FOLDER | ACGG0070501 | | Dark Silver | |
| 4 | ABFZ00 | BRACKET ASSY | ABFZ0007001 | | Dark Silver | |
| 5 | AWAB00 | WINDOW ASSY,LCD | AWAB0020801 | | | |
| 6 | BFAA00 | FILM,INMOLD | BFAA0036801 | KG245 SUB WINDOW (INMOLD) | | |
| 6 | MWAF00 | WINDOW,LCD(SUB) | MWAF0032001 | | | 13 |
| 5 | MBFF00 | BRACKET,LCD | MBFF0008401 | | Dark Gray | 15 |
| 5 | MGAD00 | PAD | MPBZ0136101 | CONN | Dark Silver | 19 |
| 5 | MGAD01 | GASKET,SHIELD FORM | MGAD0108501 | | Black | |
| 5 | MGAZ00 | GASKET | MGAZ0034001 | 12X3GOLDTAPE | Gold | |
| 5 | MPBQ00 | PAD,LCD(SUB) | MPBQ0027201 | | Black | 17 |
| 5 | MTAE00 | TAPE,WINDOW(SUB) | MTAE0026801 | | | 14 |
| 5 | MTAZ01 | TAPE,PROTECTION | MTAB0106901 | TAPE,PROTECTION BRACKET INSIDE | Blue | |
| 4 | ACGH00 | COVER ASSY, FOLDER(LOWER) | ACGH0041701 | | Dark Silver | |
| 5 | MCJH00 | COVER,FOLDER(LOWER) | MCJH0033401 | | Dark Silver | 30 |
| 5 | MFBC00 | FILTER,SPEAKER | MFBC0021301 | LOWER | Black | 28 |
| 5 | MPBG00 | PAD,LCD | MPBG0043701 | | Black | 26 |
| 5 | MPBJ00 | PAD,MOTOR | MPBJ0032101 | PAD MOTOR LOWER | Black | |
| 5 | MTAB00 | MAGNET,SWITCH | MMAA0000601 | LG-G510,511,512 common use, DIA : 3.0mm+1.5t | Silver | 27 |
| 5 | MTAD00 | TAPE,WINDOW | MTAD0049301 | MAIN | | 34 |
| 5 | MTAZ00 | TAPE | MTAZ0113001 | CAMERA | | 29 |
| 4 | ACGJ00 | COVER ASSY, FOLDER(UPPER) | ACGJ0054301 | | Black | |
| 5 | MCJJ00 | COVER,FOLDER(UPPER) | MCJJ0041101 | | Black | 8 |
| 6 | MICC00 | INSERT | MICZ0016001 | M1.4X3 | Silver | |
| 5 | MDAD00 | DECO,CAMERA | MDAD0019701 | | Blue | 4 |
| 5 | MDAY00 | DECO | MDAY0024701 | DECO FLASH | | 2 |
| 5 | MIDZ00 | INSULATOR | MIDZ0090801 | BACKUP | Blue | 64 |
| 5 | MPBJ00 | PAD,MOTOR | MPBJ0031001 | UPPER | Black | 9 |
| 5 | MPBN00 | PAD,SPEAKER | MPBN0028101 | UPPER | Black | 10 |

# 12. EXPLODED VIEW & REPLACEMENT PART LIST

| Level | Location No. | Description | Part Number | Specification | Color | Remark |
|---|---|---|---|---|---|---|
| 5 | MPBT00 | PAD,CAMERA | MPBT0026301 | | Black | 12 |
| 5 | MPBZ00 | PAD | MPBZ0121301 | PAD_BATT | Black | |
| 5 | MTAA00 | TAPE,DECO | MTAA0110001 | CAMERA | | 5 |
| 5 | MTAA01 | TAPE,DECO | MTAA0109901 | FLASH | | 3 |
| 5 | MTAB00 | TAPE,PROTECTION | MTAB0100301 | | | |
| 5 | MTAB01 | TAPE,PROTECTION | MTAB0112801 | | | 63 |
| 5 | MTAD00 | TAPE,WINDOW | MTAD0049201 | CAMERA | | 7 |
| 5 | MWAE00 | WINDOW,CAMERA | MWAE0015001 | | | 6 |
| 4 | ACGK00 | COVER ASSY,FRONT | ACGK0067701 | | Dark Silver | |
| 5 | MBHY00 | BUMPER | MBHY0018201 | | Dark Silver | 37 |
| 5 | MCJK00 | COVER,FRONT | MCJK0054801 | | Dark Silver | 39 |
| 6 | MICA00 | INSERT,FRONT | MICA0021101 | | Cyber Mirror | |
| 5 | MDAG00 | DECO,FRONT | MDAG0017701 | | Dark Gray | 38 |
| 5 | MFBD00 | FILTER,MIKE | MFBD0014101 | LOWER | Black | 42 |
| 5 | MGAD00 | GASKET,SHIELD FORM | MGAD0111401 | GASKET, SHIELD TAPE(FRONT) | Gold | 18,40 |
| 5 | MPBZ00 | PAD | MPBZ0125601 | PAD MIC | Black | |
| 5 | MSGB00 | STOPPER,HINGE | MSGB0013301 | | Gray | 36 |
| 5 | MTAZ00 | TAPE | MTAZ0132001 | STOPPER HINGE | | 62 |
| 4 | GMEY00 | SCREW MACHINE,BIND | GMEY0002001 | 1.4 mm,3 mm,MSWR3(BK) ,B ,+ ,HEAD t=0.6, HEAD d2.7 | | |
| 4 | MCCH00 | CAP,SCREW | MCCH0074601 | | Silver | 33 |
| 4 | MGAZ00 | GASKET | MGAZ0028601 | GASKET SHIELD | Gold | 70 |
| 4 | MHFD00 | HINGE,FOLDER | MHFD0011801 | | | 31 |
| 4 | MIDA00 | INSULATOR,LCD | MIDA0019601 | | Blue | 68 |
| 4 | MIDA01 | INSULATOR,LCD | MIDA0019701 | INSULATOR,LCD2 | Blue | 69 |
| 4 | MPBF00 | PAD,FLEXIBLE PCB | MPBF0014701 | | Black | 66 |
| 4 | MTAB00 | TAPE,PROTECTION | MTAB0101401 | | | 67 |
| 4 | MWAC00 | WINDOW,LCD | MWAC0063401 | | | 35 |
| 4 | MBFZ00 | BRACKET | MBFZ0024801 | SHIELD REAR | Silver | 75 |
| 4 | MBJL00 | BUTTON,SIDE | MBJL0030101 | | Dark Gray | 46 |
| 4 | MCCC00 | CAP,EARPHONE JACK | MCCC0033201 | | Silver | 49 |
| 4 | MCJN00 | COVER,REAR | MCJN0050401 | | Dark Silver | 53 |
| 4 | MGAD00 | GASKET,SHIELD FORM | MGAD0107801 | BTOB CONN | Gold | 16,48 |
| 4 | MGAZ00 | GASKET | MGAZ0030501 | 3X7.0 | Gold | 76 |
| 4 | MIDZ00 | INSULATOR | MIDZ0097201 | 6.3x3.5 PC SHEET 0.1t | Black | |
| 4 | MLEA00 | LOCKER,BATTERY | MLEA0029001 | | Dark Silver | 57 |
| 4 | MLEY00 | LOCKER | MLEY0000801 | SIM LOCKER | Silver | 54 |

| Level | Location No. | Description | Part Number | Specification | Color | Remark |
|---|---|---|---|---|---|---|
| 4 | MPBH00 | PAD,MIKE | MPBH0020701 | REAR | Black | 50 |
| 4 | MPBZ00 | PAD | MPBZ0122701 | SHIELD | Black | 74 |
| 4 | MSDZ00 | SPRING,LOCKER | MSDC0004101 | | Pearl Blue | |
| 4 | MTAB00 | TAPE,PROTECTION | MTAB0100601 | SIDE_KEY | Blue | 51 |
| 4 | MTAC00 | TAPE,SHIELD | MTAC0034701 | | | 73 |
| 3 | MCCE00 | CAP,RECEPTACLE | MCCE0026501 | | Silver | 47 |
| 3 | MCCF00 | CAP,MOBILE SWITCH | MCCF0033201 | | Dark Silver | 28 |
| 3 | MKAZ00 | KEYPAD | MKAZ0027401 | | Dark Silver | |
| 5 | MIDZ00 | INSULATOR | MIDZ0098901 | 5X10 BLUE 0.05t | Blue | |
| 5 | MIDZ01 | INSULATOR | MIDZ0086601 | INSULATOR PCB TOP | Blue | 78 |
| 5 | MIDZ02 | INSULATOR | MIDZ0096801 | PCB-2 | Blue | 80 |
| 5 | MIDZ03 | INSULATOR | MIDZ0085001 | INSULATOR_PCB | Blue | 77 |

# 12. EXPLODED VIEW & REPLACEMENT PART LIST

## <Main component>

**Note:** This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

| Level | Location No. | Description | Part Number | Specification | Color | Remark |
|---|---|---|---|---|---|---|
| 4 | SACY00 | PCB ASSY,FLEXIBLE | SACY0042002 | | | 22 |
| 5 | SACE00 | PCB ASSY,FLEXIBLE,SMT | SACE0037102 | | | |
| 6 | SACC00 | PCB ASSY,FLEXIBLE,SMT BOTTOM | SACC0024601 | | Black | |
| 7 | CN101 | CONNECTOR, BOARD TO BOARD | ENBY0013007 | 60 PIN,0.4 mm,STRAIGHT ,AU ,STACKING HEIGHT 1.5 / HEADER FOR LCM FPCB | | |
| 7 | CN102 | CONNECTOR, BOARD TO BOARD | ENBY0019501 | 20 PIN,.4 mm,ETC , ,H=1.5, Socket | | |
| 7 | CN103 | CONNECTOR, BOARD TO BOARD | ENBY0027407 | 40 PIN,0.4 mm,ETC ,AU ,H:1.0MM | | |
| 6 | SACD00 | PCB ASSY,FLEXIBLE,SMT TOP | SACD0034501 | | Black | |
| 7 | LD100 | DIODE,LED,MODULE | EDLM0008702 | WHITE ,3 LED,3.5*2.8*1.0 ,R/TP ,1.0t | | |
| 7 | LD101 | DIODE,LED,CHIP | EDLH0007901 | RED ,1608 ,R/TP ,Indicator,0.4T Red LED | | |
| 7 | R100 | RES,CHIP | ERHY0000231 | 390 ohm,1/16W,J,1005,R/TP | | |
| 6 | SPCY00 | PCB,FLEXIBLE | SPCY0071801 | POLYI ,.5 mm,MULTI-5 ,KG245 LCD FPCB | | |
| 4 | SJMY00 | VIBRATOR,MOTOR | SJMY0006503 | 3 V,0.08 A,10*3.45 ,17mm double tape | | 20 |
| 4 | SUSY00 | SPEAKER | SUSY0015501 | ASSY ,8 ohm,90 dB,16 mm,3.7T | | 21 |
| 4 | SVCY00 | CAMERA | SVCY0009501 | CMOS ,VGA ,Omnnivision 1/6" | | 25 |
| 4 | SVLM00 | LCD MODULE | SVLM0017801 | MAIN ,M_128*160 S_96_64 ,M_33.8*46.24*4.0 ,262k ,TFT ,TM ,M_LGDP4511 S_LGDP4213 ,S_PM OLED 65K | | 24 |
| 4 | | BATTERY,CELL,LITHIUM | SBCL0001303 | 2 V,1 mAh,COIN ,SOLDER TYPE BACKUP BATTERY | | |
| 3 | ACGM00 | COVER ASSY,REAR | ACGM0068601 | | Black | |
| 4 | ENZY00 | CONNECTOR,ETC | ENZY0013201 | 2 PIN,3 mm,ETC , ,H=6.5 | | 72 |
| 4 | SNGF00 | ANTENNA,GSM,FIXED | SNGF0015801 | 4.0:1 ,0 dBd, ,GSM900/DCS1800/PCS1900 Internal Pb-free | | 71 |
| 3 | GMEY00 | SCREW MACHINE,BIND | GMEY0002001 | 1.4 mm,3 mm,MSWR3(BK) ,B ,+ ,HEAD t=0.6, HEAD d2.7 | | 32,55 |
| 3 | SAFY00 | PCB ASSY,MAIN | SAFY0156502 | | | 45 |
| 4 | SAFB00 | PCB ASSY,MAIN,INSERT | SAFB0055902 | | | |
| 5 | ADCA00 | DOME ASSY,METAL | ADCA0048001 | | | 44 |
| 5 | MGAZ00 | GASKET | MGAZ0029801 | | Gold | 79 |
| 5 | SPKY00 | PCB,SIDEKEY | SPKY0029401 | POLYI ,0.2 mm,DOUBLE ,KG245 CAMERA-VOLUME SIDEKEY FPCB | | |
| 5 | SUMY00 | MICROPHONE | SUMY0003802 | FPCB ,-42 dB,4*1.5 , | | |
| 4 | SAFF00 | PCB ASSY,MAIN,SMT | SAFF0078802 | | | |
| 5 | MLAB00 | LABEL,A/S | MLAB0000601 | HUMIDITY STICKER | | |
| 5 | MLAC00 | LABEL,BARCODE | MLAC0003301 | EZ LOOKS(use for PCB ASSY MAIN(hardware)) | | |

| Level | Location No. | Description | Part Number | Specification | Color | Remark |
|---|---|---|---|---|---|---|
| 5 | SAFC00 | PCB ASSY,MAIN,SMT BOTTOM | SAFC0069303 | | | |
| 6 | ANT201 | ANTENNA,GSM,FIXED | SNGF0015701 | 3.0:1 ,0 dBd, ,3.0:1,5.4*2.0*1.5 Bluetooth Chip Pb-Free | | |
| 6 | C101 | CAP,CERAMIC,CHIP | ECCH0002002 | 47000 pF,10V ,K ,B ,HD ,1005 ,R/TP | | |
| 6 | C102 | CAP,CERAMIC,CHIP | ECCH0000182 | 0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP | | |
| 6 | C103 | CAP,CERAMIC,CHIP | ECCH0000182 | 0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP | | |
| 6 | C104 | CAP,CERAMIC,CHIP | ECCH0000182 | 0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP | | |
| 6 | C105 | CAP,CERAMIC,CHIP | ECCH0000182 | 0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP | | |
| 6 | C106 | CAP,CERAMIC,CHIP | ECCH0000182 | 0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP | | |
| 6 | C107 | CAP,CERAMIC,CHIP | ECCH0002002 | 47000 pF,10V ,K ,B ,HD ,1005 ,R/TP | | |
| 6 | C108 | CAP,CERAMIC,CHIP | ECCH0002002 | 47000 pF,10V ,K ,B ,HD ,1005 ,R/TP | | |
| 6 | C109 | CAP,CERAMIC,CHIP | ECCH0000182 | 0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP | | |
| 6 | C110 | CAP,CERAMIC,CHIP | ECCH0000393 | 22 uF,6.3V ,M ,X5R ,HD ,2012 ,R/TP | | |
| 6 | C111 | CAP,CERAMIC,CHIP | ECCH0000115 | 22 pF,50V,J,NP0,TC,1005,R/TP | | |
| 6 | C112 | CAP,CERAMIC,CHIP | ECCH0002002 | 47000 pF,10V ,K ,B ,HD ,1005 ,R/TP | | |
| 6 | C113 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C114 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C115 | CAP,CERAMIC,CHIP | ECCH0000182 | 0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP | | |
| 6 | C116 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C117 | CAP,CHIP,MAKER | ECZH0001421 | 2.2 uF,6.3V ,K ,X5R ,HD ,1608 ,R/TP | | |
| 6 | C118 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C119 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C120 | CAP,CERAMIC,CHIP | ECCH0000122 | 47 pF,50V,J,NP0,TC,1005,R/TP | | |
| 6 | C121 | CAP,CERAMIC,CHIP | ECCH0000165 | 68 nF,6.3V,K,X5R,HD,1005,R/TP | | |
| 6 | C122 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C125 | CAP,CERAMIC,CHIP | ECCH0006201 | 4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP | | |
| 6 | C126 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C128 | CAP,CERAMIC,CHIP | ECCH0000143 | 1 nF,50V,K,X7R,HD,1005,R/TP | | |
| 6 | C130 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C131 | CAP,CERAMIC,CHIP | ECCH0000120 | 39 pF,50V,J,NP0,TC,1005,R/TP | | |
| 6 | C132 | CAP,CERAMIC,CHIP | ECCH0000120 | 39 pF,50V,J,NP0,TC,1005,R/TP | | |
| 6 | C133 | CAP,CERAMIC,CHIP | ECCH0000120 | 39 pF,50V,J,NP0,TC,1005,R/TP | | |
| 6 | C134 | CAP,CERAMIC,CHIP | ECCH0000120 | 39 pF,50V,J,NP0,TC,1005,R/TP | | |
| 6 | C136 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C137 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C138 | CAP,CERAMIC,CHIP | ECCH0000120 | 39 pF,50V,J,NP0,TC,1005,R/TP | | |
| 6 | C139 | CAP,CERAMIC,CHIP | ECCH0000120 | 39 pF,50V,J,NP0,TC,1005,R/TP | | |

# 12. EXPLODED VIEW & REPLACEMENT PART LIST

| Level | Location No. | Description | Part Number | Specification | Color | Remark |
|---|---|---|---|---|---|---|
| 6 | C140 | CAP,CERAMIC,CHIP | ECCH0000120 | 39 pF,50V,J,NP0,TC,1005,R/TP | | |
| 6 | C141 | CAP,CERAMIC,CHIP | ECCH0000182 | 0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP | | |
| 6 | C142 | CAP,CERAMIC,CHIP | ECCH0000120 | 39 pF,50V,J,NP0,TC,1005,R/TP | | |
| 6 | C143 | CAP,CERAMIC,CHIP | ECCH0000120 | 39 pF,50V,J,NP0,TC,1005,R/TP | | |
| 6 | C144 | CAP,CERAMIC,CHIP | ECCH0000120 | 39 pF,50V,J,NP0,TC,1005,R/TP | | |
| 6 | C201 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C202 | CAP,CERAMIC,CHIP | ECCH0007901 | 10 uF,4V ,M ,X5R ,TC ,1608 ,R/TP | | |
| 6 | C203 | CAP,CERAMIC,CHIP | ECCH0000182 | 0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP | | |
| 6 | C204 | CAP,TANTAL,CHIP,MAKER | ECTZ0005201 | 10 uF,6.3V ,M ,L_ESR ,1608 ,R/TP | | |
| 6 | C206 | CAP,TANTAL,CHIP,MAKER | ECTZ0003602 | 22 uF,6.3V ,M ,STD ,2012 ,R/TP | | |
| 6 | C208 | CAP,CERAMIC,CHIP | ECCH0000120 | 39 pF,50V,J,NP0,TC,1005,R/TP | | |
| 6 | C210 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C211 | CAP,CERAMIC,CHIP | ECCH0000120 | 39 pF,50V,J,NP0,TC,1005,R/TP | | |
| 6 | C212 | CAP,CERAMIC,CHIP | ECCH0000120 | 39 pF,50V,J,NP0,TC,1005,R/TP | | |
| 6 | C214 | CAP,TANTAL,CHIP,MAKER | ECTZ0000406 | 33 uF,10V ,M ,STD ,3216 ,R/TP | | |
| 6 | C215 | CAP,CERAMIC,CHIP | ECCH0000182 | 0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP | | |
| 6 | C216 | CAP,CERAMIC,CHIP | ECCH0000182 | 0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP | | |
| 6 | C217 | CAP,CERAMIC,CHIP | ECCH0000120 | 39 pF,50V,J,NP0,TC,1005,R/TP | | |
| 6 | C218 | CAP,CERAMIC,CHIP | ECCH0000120 | 39 pF,50V,J,NP0,TC,1005,R/TP | | |
| 6 | C219 | CAP,CERAMIC,CHIP | ECCH0000120 | 39 pF,50V,J,NP0,TC,1005,R/TP | | |
| 6 | C220 | CAP,CERAMIC,CHIP | ECCH0000120 | 39 pF,50V,J,NP0,TC,1005,R/TP | | |
| 6 | C221 | CAP,CERAMIC,CHIP | ECCH0007801 | 4.7 uF,10V ,Z ,Y5V ,HD ,1608 ,R/TP | | |
| 6 | C222 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C223 | CAP,CERAMIC,CHIP | ECCH0000182 | 0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP | | |
| 6 | C224 | CAP,CERAMIC,CHIP | ECCH0007801 | 4.7 uF,10V ,Z ,Y5V ,HD ,1608 ,R/TP | | |
| 6 | C225 | CAP,CERAMIC,CHIP | ECCH0007801 | 4.7 uF,10V ,Z ,Y5V ,HD ,1608 ,R/TP | | |
| 6 | C226 | CAP,CERAMIC,CHIP | ECCH0000182 | 0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP | | |
| 6 | C227 | CAP,CERAMIC,CHIP | ECCH0000182 | 0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP | | |
| 6 | C228 | CAP,CERAMIC,CHIP | ECCH0000182 | 0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP | | |
| 6 | C229 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C230 | CAP,CERAMIC,CHIP | ECCH0000112 | 15 pF,50V,J,NP0,TC,1005,R/TP | | |
| 6 | C231 | CAP,CERAMIC,CHIP | ECCH0007901 | 10 uF,4V ,M ,X5R ,TC ,1608 ,R/TP | | |
| 6 | C232 | CAP,CERAMIC,CHIP | ECCH0000182 | 0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP | | |
| 6 | C233 | CAP,CHIP,MAKER | ECZH0001421 | 2.2 uF,6.3V ,K ,X5R ,HD ,1608 ,R/TP | | |
| 6 | C234 | CAP,CERAMIC,CHIP | ECCH0000112 | 15 pF,50V,J,NP0,TC,1005,R/TP | | |
| 6 | C235 | CAP,CERAMIC,CHIP | ECCH0000147 | 2.2 nF,50V,K,X7R,HD,1005,R/TP | | |
| 6 | C236 | CAP,CERAMIC,CHIP | ECCH0000182 | 0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP | | |

| Level | Location No. | Description | Part Number | Specification | Color | Remark |
|---|---|---|---|---|---|---|
| 6 | C238 | CAP,CHIP,MAKER | ECZH0001421 | 2.2 uF,6.3V ,K ,X5R ,HD ,1608 ,R/TP | | |
| 6 | C239 | CAP,CHIP,MAKER | ECZH0001421 | 2.2 uF,6.3V ,K ,X5R ,HD ,1608 ,R/TP | | |
| 6 | C240 | CAP,CERAMIC,CHIP | ECCH0000182 | 0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP | | |
| 6 | C241 | CAP,CERAMIC,CHIP | ECCH0000155 | 10 nF,16V,K,X7R,HD,1005,R/TP | | |
| 6 | C242 | CAP,CERAMIC,CHIP | ECCH0000138 | 390 pF,50V,K,X7R,HD,1005,R/TP | | |
| 6 | C243 | CAP,CERAMIC,CHIP | ECCH0000179 | 22 nF,16V ,K ,X5R ,HD ,1005 ,R/TP | | |
| 6 | C244 | CAP,CERAMIC,CHIP | ECCH0000122 | 47 pF,50V,J,NP0,TC,1005,R/TP | | |
| 6 | C245 | CAP,CERAMIC,CHIP | ECCH0000122 | 47 pF,50V,J,NP0,TC,1005,R/TP | | |
| 6 | C246 | CAP,CERAMIC,CHIP | ECCH0000122 | 47 pF,50V,J,NP0,TC,1005,R/TP | | |
| 6 | C247 | CAP,CERAMIC,CHIP | ECCH0000161 | 33 nF,16V,K,X7R,HD,1005,R/TP | | |
| 6 | C249 | CAP,CERAMIC,CHIP | ECCH0000112 | 15 pF,50V,J,NP0,TC,1005,R/TP | | |
| 6 | C250 | CAP,CHIP,MAKER | ECZH0000813 | 100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP | | |
| 6 | C251 | CAP,CERAMIC,CHIP | ECCH0000182 | 0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP | | |
| 6 | C315 | CAP,CHIP,MAKER | ECZH0000826 | 27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP | | |
| 6 | C316 | CAP,CHIP,MAKER | ECZH0000826 | 27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP | | |
| 6 | C317 | CAP,CERAMIC,CHIP | ECCH0006201 | 4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP | | |
| 6 | C318 | CAP,CHIP,MAKER | ECZH0001211 | 220 nF,10V ,Z ,Y5V ,HD ,1005 ,R/TP | | |
| 6 | C319 | CAP,TANTAL,CHIP,MAKER | ECTZ0005201 | 10 uF,6.3V ,M ,L_ESR ,1608 ,R/TP | | |
| 6 | C320 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C321 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C322 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C323 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C325 | CAP,CERAMIC,CHIP | ECCH0000115 | 22 pF,50V,J,NP0,TC,1005,R/TP | | |
| 6 | C326 | CAP,CERAMIC,CHIP | ECCH0000143 | 1 nF,50V,K,X7R,HD,1005,R/TP | | |
| 6 | C327 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C328 | CAP,CERAMIC,CHIP | ECCH0000182 | 0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP | | |
| 6 | C329 | CAP,CERAMIC,CHIP | ECCH0000182 | 0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP | | |
| 6 | C330 | CAP,CERAMIC,CHIP | ECCH0000182 | 0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP | | |
| 6 | C331 | CAP,CERAMIC,CHIP | ECCH0000143 | 1 nF,50V,K,X7R,HD,1005,R/TP | | |
| 6 | C400 | CAP,CERAMIC,CHIP | ECCH0000155 | 10 nF,16V,K,X7R,HD,1005,R/TP | | |
| 6 | C401 | CAP,CERAMIC,CHIP | ECCH0000155 | 10 nF,16V,K,X7R,HD,1005,R/TP | | |
| 6 | C404 | CAP,CERAMIC,CHIP | ECCH0000393 | 22 uF,6.3V ,M ,X5R ,HD ,2012 ,R/TP | | |
| 6 | C405 | CAP,CHIP,MAKER | ECZH0000826 | 27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP | | |
| 6 | C406 | CAP,CHIP,MAKER | ECZH0000826 | 27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP | | |
| 6 | C407 | CAP,CHIP,MAKER | ECZH0000802 | 1 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP | | |
| 6 | C408 | CAP,CHIP,MAKER | ECZH0000830 | 33 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP | | |
| 6 | C409 | CAP,CHIP,MAKER | ECZH0000853 | 8.2 pF,50V ,D ,NP0 ,TC ,1005 ,R/TP | | |

# 12. EXPLODED VIEW & REPLACEMENT PART LIST

| Level | Location No. | Description | Part Number | Specification | Color | Remark |
|---|---|---|---|---|---|---|
| 6 | C411 | CAP,CERAMIC,CHIP | ECCH0000115 | 22 pF,50V,J,NP0,TC,1005,R/TP | | |
| 6 | C412 | CAP,CHIP,MAKER | ECZH0004402 | 0.1 uF,16V ,Z ,NP0 ,TC ,1005 ,R/TP | | |
| 6 | C413 | CAP,CHIP,MAKER | ECZH0000813 | 100 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP | | |
| 6 | C414 | CAP,CERAMIC,CHIP | ECCH0000110 | 10 pF,50V,D,NP0,TC,1005,R/TP | | |
| 6 | C415 | CAP,CERAMIC,CHIP | ECCH0000155 | 10 nF,16V,K,X7R,HD,1005,R/TP | | |
| 6 | C416 | CAP,CERAMIC,CHIP | ECCH0000155 | 10 nF,16V,K,X7R,HD,1005,R/TP | | |
| 6 | C417 | CAP,CERAMIC,CHIP | ECCH0000115 | 22 pF,50V,J,NP0,TC,1005,R/TP | | |
| 6 | C420 | CAP,CERAMIC,CHIP | ECCH0000120 | 39 pF,50V,J,NP0,TC,1005,R/TP | | |
| 6 | C421 | CAP,CHIP,MAKER | ECZH0000826 | 27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP | | |
| 6 | C422 | CAP,CERAMIC,CHIP | ECCH0000120 | 39 pF,50V,J,NP0,TC,1005,R/TP | | |
| 6 | C423 | CAP,CHIP,MAKER | ECZH0000803 | 2 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP | | |
| 6 | C424 | CAP,CERAMIC,CHIP | ECCH0000120 | 39 pF,50V,J,NP0,TC,1005,R/TP | | |
| 6 | C425 | CAP,CERAMIC,CHIP | ECCH0000178 | 1.8 pF,50V ,D ,NP0 ,TC ,1005 ,R/TP | | |
| 6 | C426 | CAP,CHIP,MAKER | ECZH0000822 | 1.5 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP | | |
| 6 | C427 | CAP,CHIP,MAKER | ECZH0000822 | 1.5 pF,50V ,C ,NP0 ,TC ,1005 ,R/TP | | |
| 6 | C428 | CAP,CHIP,MAKER | ECZH0000816 | 12 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP | | |
| 6 | C429 | CAP,CHIP,MAKER | ECZH0000826 | 27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP | | |
| 6 | C430 | CAP,CHIP,MAKER | ECZH0000826 | 27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP | | |
| 6 | C431 | CAP,CHIP,MAKER | ECZH0000826 | 27 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP | | |
| 6 | C432 | CAP,CHIP,MAKER | ECZH0000816 | 12 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP | | |
| 6 | C433 | CAP,CHIP,MAKER | ECZH0001421 | 2.2 uF,6.3V ,K ,X5R ,HD ,1608 ,R/TP | | |
| 6 | C434 | CAP,CERAMIC,CHIP | ECCH0000115 | 22 pF,50V,J,NP0,TC,1005,R/TP | | |
| 6 | C435 | CAP,CERAMIC,CHIP | ECCH0000182 | 0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP | | |
| 6 | C436 | CAP,CERAMIC,CHIP | ECCH0000143 | 1 nF,50V,K,X7R,HD,1005,R/TP | | |
| 6 | C437 | CAP,CERAMIC,CHIP | ECCH0000143 | 1 nF,50V,K,X7R,HD,1005,R/TP | | |
| 6 | C438 | CAP,CERAMIC,CHIP | ECCH0000143 | 1 nF,50V,K,X7R,HD,1005,R/TP | | |
| 6 | C439 | CAP,CHIP,MAKER | ECZH0001116 | 270 pF,50V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 6 | C440 | CAP,CHIP,MAKER | ECZH0001116 | 270 pF,50V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 6 | C441 | CAP,CERAMIC,CHIP | ECCH0000143 | 1 nF,50V,K,X7R,HD,1005,R/TP | | |
| 6 | C442 | CAP,CHIP,MAKER | ECZH0001421 | 2.2 uF,6.3V ,K ,X5R ,HD ,1608 ,R/TP | | |
| 6 | C444 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C445 | CAP,CERAMIC,CHIP | ECCH0000155 | 10 nF,16V,K,X7R,HD,1005,R/TP | | |
| 6 | C446 | CAP,CERAMIC,CHIP | ECCH0006201 | 4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP | | |
| 6 | C447 | INDUCTOR,CHIP | ELCH0005010 | 1.8 nH,S ,1005 ,R/TP , | | |
| 6 | C501 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C502 | CAP,CERAMIC,CHIP | ECCH0000155 | 10 nF,16V,K,X7R,HD,1005,R/TP | | |
| 6 | C503 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |

| Level | Location No. | Description | Part Number | Specification | Color | Remark |
|---|---|---|---|---|---|---|
| 6 | C504 | CAP,CERAMIC,CHIP | ECCH0007901 | 10 uF,4V ,M ,X5R ,TC ,1608 ,R/TP | | |
| 6 | C505 | CAP,TANTAL,CHIP,MAKER | ECTZ0005201 | 10 uF,6.3V ,M ,L_ESR ,1608 ,R/TP | | |
| 6 | C506 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C507 | CAP,CERAMIC,CHIP | ECCH0000182 | 0.1 uF,10V ,K ,X5R ,HD ,1005 ,R/TP | | |
| 6 | C508 | CAP,CERAMIC,CHIP | ECCH0000155 | 10 nF,16V,K,X7R,HD,1005,R/TP | | |
| 6 | C509 | CAP,CHIP,MAKER | ECZH0003202 | 1 uF,6.3V ,Z ,Y5V ,HD ,1005 ,R/TP | | |
| 6 | C510 | CAP,CHIP,MAKER | ECZH0003202 | 1 uF,6.3V ,Z ,Y5V ,HD ,1005 ,R/TP | | |
| 6 | C511 | CAP,CHIP,MAKER | ECZH0003202 | 1 uF,6.3V ,Z ,Y5V ,HD ,1005 ,R/TP | | |
| 6 | C512 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C513 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C514 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C515 | CAP,CERAMIC,CHIP | ECCH0006201 | 4.7 uF,6.3V ,K ,X5R ,TC ,1608 ,R/TP | | |
| 6 | C516 | CAP,CERAMIC,CHIP | ECCH0000155 | 10 nF,16V,K,X7R,HD,1005,R/TP | | |
| 6 | C517 | CAP,CERAMIC,CHIP | ECCH0007901 | 10 uF,4V ,M ,X5R ,TC ,1608 ,R/TP | | |
| 6 | C518 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C519 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C601 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C602 | VARISTOR | SEVY0005201 | 5.5 V, ,SMD ,1005, 50pF | | |
| 6 | C603 | VARISTOR | SEVY0005201 | 5.5 V, ,SMD ,1005, 50pF | | |
| 6 | C604 | VARISTOR | SEVY0003901 | 5.5 V, ,SMD ,480pF, 1005 | | |
| 6 | C605 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C606 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C607 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C613 | CAP,CHIP,MAKER | ECZH0000841 | 56 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP | | |
| 6 | C614 | CAP,CHIP,MAKER | ECZH0000841 | 56 pF,50V ,J ,NP0 ,TC ,1005 ,R/TP | | |
| 6 | CN301 | CONNECTOR,I/O | ENRY0004101 | 24 PIN,0.5 mm,ETC , ,Off-Set type | | |
| 6 | CN601 | CONNECTOR,<br>BOARD TO BOARD | ENBY0013008 | 60 PIN,0.4 mm,STRAIGHT ,AU ,STACKING HEIGHT 1.5 / SOCKET FOR LCM FPCB | | |
| 6 | D101 | DIODE,SWITCHING | EDSY0012101 | US-FLAT ,30 V,1 A,R/TP ,2.5*1.25*0.6(t) | | |
| 6 | D102 | DIODE,SWITCHING | EDSY0016001 | ESM ,15 V,100 mA,R/TP ,PB-FREE | | |
| 6 | FB101 | FILTER,BEAD,CHIP | SFBH0007102 | 10 ohm,1005 ,Ferrite Bead | | |
| 6 | FB201 | FILTER,BEAD,CHIP | SFBH0007102 | 10 ohm,1005 ,Ferrite Bead | | |
| 6 | FB501 | FILTER,BEAD,CHIP | SFBH0007102 | 10 ohm,1005 ,Ferrite Bead | | |
| 6 | FB502 | FILTER,BEAD,CHIP | SFBH0007102 | 10 ohm,1005 ,Ferrite Bead | | |
| 6 | FL400 | FILTER,SEPERATOR | SFAY0005602 | 900 ,1800.1900 ,2.7 dB,3.0 dB,30 dB,30 dB,ETC ,5.6*4.5*1.4, TRIPLE FEM | | |
| 6 | FL601 | FILTER,EMI/POWER | SFEY0007103 | SMD ,18 V, ,SMD ,4ch. R-Varistor Array(50Ohm,15pF), Pb-free | | |

# 12. EXPLODED VIEW & REPLACEMENT PART LIST

| Level | Location No. | Description | Part Number | Specification | Color | Remark |
|---|---|---|---|---|---|---|
| 6 | FL602 | FILTER,EMI/POWER | SFEY0007103 | SMD ,18 V, ,SMD ,4ch. R-Varistor Array(50Ohm,15pF), Pb-free | | |
| 6 | FL603 | FILTER,EMI/POWER | SFEY0007103 | SMD ,18 V, ,SMD ,4ch. R-Varistor Array(50Ohm,15pF), Pb-free | | |
| 6 | FL604 | FILTER,EMI/POWER | SFEY0012301 | SMD ,,18V, SMD, 6CH, 15pF, 50ohm, EMI/ESD Fillter Array, Pb-free | | |
| 6 | FL605 | FILTER,EMI/POWER | SFEY0007104 | SMD ,5.6 V, 4ch. R-Varistor Array(200Ohm,25pF) | | |
| 6 | FL606 | FILTER,EMI/POWER | SFEY0010401 | SMD ,4ch, 18V, 15pF, 50ohm Pb-free | | |
| 6 | FL607 | FILTER,EMI/POWER | SFEY0007103 | SMD ,18 V, ,SMD ,4ch. R-Varistor Array(50Ohm,15pF), Pb-free | | |
| 6 | FL608 | FILTER,EMI/POWER | SFEY0007104 | SMD ,5.6 V, 4ch. R-Varistor Array(200Ohm,25pF) | | |
| 6 | FL609 | FILTER,EMI/POWER | SFEY0007103 | SMD ,18 V, ,SMD ,4ch. R-Varistor Array(50Ohm,15pF), Pb-free | | |
| 6 | J201 | CONN,JACK/PLUG, EARPHONE | ENJE0003501 | 3 ,5 PIN, | | |
| 6 | J301 | CONN,SOCKET | ENSY0017501 | 6 PIN,ETC , ,2.54 mm,H=2.1, 5 Direction | | |
| 6 | L202 | INDUCTOR,CHIP | ELCH0004711 | 22 nH,J ,1005 ,R/TP , | | |
| 6 | L403 | INDUCTOR,CHIP | ELCH0005014 | 5.6 nH,S ,1005 ,R/TP , | | |
| 6 | L404 | INDUCTOR,CHIP | ELCH0001049 | 6.8 nH,J ,1005 ,R/TP ,PBFREE | | |
| 6 | L405 | INDUCTOR,CHIP | ELCH0005005 | 27 nH,J ,1005 ,R/TP , | | |
| 6 | L406 | INDUCTOR,CHIP | ELCH0001031 | 15 nH,J ,1005 ,R/TP ,PBFREE | | |
| 6 | L407 | INDUCTOR,CHIP | ELCH0001054 | 5.6 nH,S ,1005 ,R/TP ,PBFREE | | |
| 6 | M201 | IC | EUSY0239102 | 6.9 * 7.9 * 1.5 mm ,28 PIN,R/TP ,Bluetooth Module v1.2, 26MHz, For GSM | | |
| 6 | Q101 | TR,FET,P-CHANNEL | EQFP0004201 | 2.9*1.9*0.8(t) ,.7 W,20 V,-6 A,R/TP ,NDC652P upgrade(substitution) item, Pb free | | |
| 6 | Q201 | TR,BJT,ARRAY | EQBA0000406 | SC-70 ,0.2 W,R/TP ,CDMA,Common use | | |
| 6 | Q202 | TR,BJT,NPN | EQBN0007101 | EMT3 ,0.15 W,R/TP ,LOW FREQUENCY | | |
| 6 | Q301 | TR,BJT,ARRAY | EQBA0000406 | SC-70 ,0.2 W,R/TP ,CDMA,Common use | | |
| 6 | Q302 | TR,BJT,ARRAY | EQBA0002701 | EMT6 ,150 mW,R/TP ,NPN, PNP, 150 mA | | |
| 6 | Q501 | TR,FET,P-CHANNEL | EQFP0004501 | SOT-323 ,.29 W,1.8 V,.86 A,R/TP ,P-Chanel MOSFET, Pb free | | |
| 6 | R101 | RES,CHIP | ERHY0000201 | 0 ohm,1/16W,J,1005,R/TP | | |
| 6 | R102 | RES,CHIP | ERHY0000261 | 10K ohm,1/16W,J,1005,R/TP | | |
| 6 | R103 | RES,CHIP | ERHY0000225 | 200 ohm,1/16W,J,1005,R/TP | | |
| 6 | R104 | RES,CHIP | ERHY0001102 | 0.2 ohm,1/4W ,F ,2012 ,R/TP | | |
| 6 | R105 | RES,CHIP | ERHY0000230 | 330 ohm,1/16W,J,1005,R/TP | | |
| 6 | R106 | RES,CHIP | ERHY0000512 | 10M ohm,1/16W,J,1608,R/TP | | |
| 6 | R107 | RES,CHIP | ERHY0000280 | 100K ohm,1/16W,J,1005,R/TP | | |
| 6 | R108 | RES,CHIP | ERHY0000152 | 82K ohm,1/16W,F,1005,R/TP | | |
| 6 | R109 | RES,CHIP | ERHY0000202 | 4.7 ohm,1/16W,J,1005,R/TP | | |

| Level | Location No. | Description | Part Number | Specification | Color | Remark |
|---|---|---|---|---|---|---|
| 6 | R110 | RES,CHIP | ERHY0000202 | 4.7 ohm,1/16W,J,1005,R/TP | | |
| 6 | R111 | RES,CHIP | ERHY0000254 | 4.7K ohm,1/16W,J,1005,R/TP | | |
| 6 | R112 | RES,CHIP | ERHY0000254 | 4.7K ohm,1/16W,J,1005,R/TP | | |
| 6 | R113 | RES,CHIP | ERHY0000201 | 0 ohm,1/16W,J,1005,R/TP | | |
| 6 | R114 | RES,CHIP | ERHY0000201 | 0 ohm,1/16W,J,1005,R/TP | | |
| 6 | R201 | RES,CHIP | ERHY0000241 | 1K ohm,1/16W,J,1005,R/TP | | |
| 6 | R202 | RES,CHIP | ERHY0000241 | 1K ohm,1/16W,J,1005,R/TP | | |
| 6 | R204 | RES,CHIP | ERHY0000244 | 1.5K ohm,1/16W,J,1005,R/TP | | |
| 6 | R206 | RES,CHIP | ERHY0000247 | 2.2K ohm,1/16W,J,1005,R/TP | | |
| 6 | R209 | RES,CHIP | ERHY0007007 | 15 ohm,1/8W ,F ,2012 ,R/TP | | |
| 6 | R210 | RES,CHIP | ERHY0000220 | 100 ohm,1/16W,J,1005,R/TP | | |
| 6 | R217 | RES,CHIP | ERHY0000220 | 100 ohm,1/16W,J,1005,R/TP | | |
| 6 | R221 | RES,CHIP | ERHY0000247 | 2.2K ohm,1/16W,J,1005,R/TP | | |
| 6 | R225 | RES,CHIP | ERHY0000296 | 1M ohm,1/16W,J,1005,R/TP | | |
| 6 | R227 | RES,CHIP | ERHY0000201 | 0 ohm,1/16W,J,1005,R/TP | | |
| 6 | R228 | RES,CHIP | ERHY0000230 | 330 ohm,1/16W,J,1005,R/TP | | |
| 6 | R229 | RES,CHIP | ERHY0000201 | 0 ohm,1/16W,J,1005,R/TP | | |
| 6 | R230 | RES,CHIP | ERHY0000257 | 6.8K ohm,1/16W,J,1005,R/TP | | |
| 6 | R232 | RES,CHIP | ERHY0000213 | 47 ohm,1/16W,J,1005,R/TP | | |
| 6 | R233 | RES,CHIP | ERHY0000213 | 47 ohm,1/16W,J,1005,R/TP | | |
| 6 | R234 | RES,CHIP | ERHY0000267 | 24K ohm,1/16W,J,1005,R/TP | | |
| 6 | R235 | RES,CHIP | ERHY0000213 | 47 ohm,1/16W,J,1005,R/TP | | |
| 6 | R236 | RES,CHIP | ERHY0000213 | 47 ohm,1/16W,J,1005,R/TP | | |
| 6 | R237 | RES,CHIP | ERHY0000213 | 47 ohm,1/16W,J,1005,R/TP | | |
| 6 | R238 | RES,CHIP | ERHY0000213 | 47 ohm,1/16W,J,1005,R/TP | | |
| 6 | R239 | RES,CHIP | ERHY0000152 | 82K ohm,1/16W,F,1005,R/TP | | |
| 6 | R240 | RES,CHIP | ERHY0000261 | 10K ohm,1/16W,J,1005,R/TP | | |
| 6 | R242 | RES,CHIP | ERHY0000265 | 20K ohm,1/16W,J,1005,R/TP | | |
| 6 | R301 | RES,CHIP | ERHY0000261 | 10K ohm,1/16W,J,1005,R/TP | | |
| 6 | R302 | RES,CHIP | ERHY0000237 | 680 ohm,1/16W,J,1005,R/TP | | |
| 6 | R322 | RES,CHIP | ERHY0000237 | 680 ohm,1/16W,J,1005,R/TP | | |
| 6 | R325 | RES,CHIP | ERHY0000262 | 12K ohm,1/16W,J,1005,R/TP | | |
| 6 | R326 | RES,CHIP | ERHY0000203 | 10 ohm,1/16W,J,1005,R/TP | | |
| 6 | R327 | RES,CHIP | ERHY0000203 | 10 ohm,1/16W,J,1005,R/TP | | |
| 6 | R328 | RES,CHIP | ERHY0000262 | 12K ohm,1/16W,J,1005,R/TP | | |
| 6 | R329 | RES,CHIP | ERHY0000203 | 10 ohm,1/16W,J,1005,R/TP | | |
| 6 | R330 | RES,CHIP | ERHY0000203 | 10 ohm,1/16W,J,1005,R/TP | | |

# 12. EXPLODED VIEW & REPLACEMENT PART LIST

| Level | Location No. | Description | Part Number | Specification | Color | Remark |
|---|---|---|---|---|---|---|
| 6 | R333 | RES,CHIP | ERHY0000237 | 680 ohm,1/16W,J,1005,R/TP | | |
| 6 | R334 | RES,CHIP | ERHY0000273 | 47K ohm,1/16W,J,1005,R/TP | | |
| 6 | R344 | RES,CHIP | ERHY0000280 | 100K ohm,1/16W,J,1005,R/TP | | |
| 6 | R345 | RES,CHIP | ERHY0000280 | 100K ohm,1/16W,J,1005,R/TP | | |
| 6 | R346 | RES,CHIP | ERHY0000280 | 100K ohm,1/16W,J,1005,R/TP | | |
| 6 | R347 | RES,CHIP | ERHY0000280 | 100K ohm,1/16W,J,1005,R/TP | | |
| 6 | R348 | RES,CHIP | ERHY0000280 | 100K ohm,1/16W,J,1005,R/TP | | |
| 6 | R350 | RES,CHIP | ERHY0000203 | 10 ohm,1/16W,J,1005,R/TP | | |
| 6 | R351 | RES,CHIP | ERHY0000226 | 220 ohm,1/16W,J,1005,R/TP | | |
| 6 | R353 | RES,CHIP | ERHY0000244 | 1.5K ohm,1/16W,J,1005,R/TP | | |
| 6 | R355 | RES,CHIP | ERHY0000213 | 47 ohm,1/16W,J,1005,R/TP | | |
| 6 | R357 | RES,CHIP | ERHY0000258 | 7.5K ohm,1/16W,J,1005,R/TP | | |
| 6 | R358 | RES,CHIP | ERHY0000220 | 100 ohm,1/16W,J,1005,R/TP | | |
| 6 | R360 | RES,CHIP | ERHY0000213 | 47 ohm,1/16W,J,1005,R/TP | | |
| 6 | R361 | RES,CHIP | ERHY0000213 | 47 ohm,1/16W,J,1005,R/TP | | |
| 6 | R363 | RES,CHIP | ERHY0000213 | 47 ohm,1/16W,J,1005,R/TP | | |
| 6 | R364 | RES,CHIP | ERHY0000213 | 47 ohm,1/16W,J,1005,R/TP | | |
| 6 | R365 | RES,CHIP | ERHY0000213 | 47 ohm,1/16W,J,1005,R/TP | | |
| 6 | R366 | RES,CHIP | ERHY0000213 | 47 ohm,1/16W,J,1005,R/TP | | |
| 6 | R367 | RES,CHIP | ERHY0000213 | 47 ohm,1/16W,J,1005,R/TP | | |
| 6 | R368 | RES,CHIP | ERHY0000213 | 47 ohm,1/16W,J,1005,R/TP | | |
| 6 | R369 | RES,CHIP | ERHY0000265 | 20K ohm,1/16W,J,1005,R/TP | | |
| 6 | R370 | RES,CHIP | ERHY0000213 | 47 ohm,1/16W,J,1005,R/TP | | |
| 6 | R373 | RES,CHIP | ERHY0000273 | 47K ohm,1/16W,J,1005,R/TP | | |
| 6 | R374 | RES,CHIP | ERHY0000273 | 47K ohm,1/16W,J,1005,R/TP | | |
| 6 | R375 | RES,CHIP | ERHY0000280 | 100K ohm,1/16W,J,1005,R/TP | | |
| 6 | R376 | RES,CHIP | ERHY0000220 | 100 ohm,1/16W,J,1005,R/TP | | |
| 6 | R403 | RES,CHIP | ERHY0008201 | 24 ohm,1/16W ,J ,1005 ,R/TP | | |
| 6 | R404 | RES,CHIP | ERHY0000226 | 220 ohm,1/16W,J,1005,R/TP | | |
| 6 | R405 | RES,CHIP | ERHY0000226 | 220 ohm,1/16W,J,1005,R/TP | | |
| 6 | R407 | RES,CHIP | ERHY0000210 | 30 ohm,1/16W,J,1005,R/TP | | |
| 6 | R408 | RES,CHIP | ERHY0000224 | 180 ohm,1/16W,J,1005,R/TP | | |
| 6 | R409 | RES,CHIP | ERHY0000224 | 180 ohm,1/16W,J,1005,R/TP | | |
| 6 | R410 | RES,CHIP | ERHY0000241 | 1K ohm,1/16W,J,1005,R/TP | | |
| 6 | R412 | RES,CHIP | ERHY0000201 | 0 ohm,1/16W,J,1005,R/TP | | |
| 6 | R415 | RES,CHIP,MAKER | ERHZ0000205 | 1 Mohm,1/16W ,F ,1005 ,R/TP | | |
| 6 | R416 | RES,CHIP | ERHY0000220 | 100 ohm,1/16W,J,1005,R/TP | | |

| Level | Location No. | Description | Part Number | Specification | Color | Remark |
|---|---|---|---|---|---|---|
| 6 | R417 | RES,CHIP | ERHY0000263 | 15K ohm,1/16W,J,1005,R/TP | | |
| 6 | R419 | RES,CHIP | ERHY0000280 | 100K ohm,1/16W,J,1005,R/TP | | |
| 6 | R502 | RES,CHIP | ERHY0000280 | 100K ohm,1/16W,J,1005,R/TP | | |
| 6 | R503 | RES,CHIP | ERHY0000280 | 100K ohm,1/16W,J,1005,R/TP | | |
| 6 | R504 | RES,CHIP | ERHY0000280 | 100K ohm,1/16W,J,1005,R/TP | | |
| 6 | R505 | RES,CHIP | ERHY0000208 | 22 ohm,1/16W,J,1005,R/TP | | |
| 6 | R506 | RES,CHIP | ERHY0000244 | 1.5K ohm,1/16W,J,1005,R/TP | | |
| 6 | R507 | RES,CHIP | ERHY0000241 | 1K ohm,1/16W,J,1005,R/TP | | |
| 6 | R508 | RES,CHIP | ERHY0000280 | 100K ohm,1/16W,J,1005,R/TP | | |
| 6 | R509 | RES,CHIP | ERHY0000280 | 100K ohm,1/16W,J,1005,R/TP | | |
| 6 | R511 | RES,CHIP | ERHY0000244 | 1.5K ohm,1/16W,J,1005,R/TP | | |
| 6 | R512 | RES,CHIP | ERHY0000241 | 1K ohm,1/16W,J,1005,R/TP | | |
| 6 | R601 | RES,CHIP | ERHY0000254 | 4.7K ohm,1/16W,J,1005,R/TP | | |
| 6 | R602 | RES,CHIP | ERHY0000254 | 4.7K ohm,1/16W,J,1005,R/TP | | |
| 6 | R603 | RES,CHIP | ERHY0000220 | 100 ohm,1/16W,J,1005,R/TP | | |
| 6 | R604 | RES,CHIP | ERHY0000280 | 100K ohm,1/16W,J,1005,R/TP | | |
| 6 | R605 | RES,CHIP | ERHY0000220 | 100 ohm,1/16W,J,1005,R/TP | | |
| 6 | R606 | RES,CHIP | ERHY0000220 | 100 ohm,1/16W,J,1005,R/TP | | |
| 6 | SW400 | CONN,RF SWITCH | ENWY0002301 | ANGLE ,SMD ,0.8 dB, | | |
| 6 | U101 | IC | EUSY0169301 | 148-TERMINAL BGA ,148 PIN,R/TP ,GSM ANALOG BASEBAND / TYPHOON B, Pb Free | | |
| 6 | U102 | IC | EUSY0181504 | CSP BGA ,204 PIN,R/TP ,AD6527 w/USB | | |
| 6 | U201 | IC | EUSY0204801 | SC82-AB (SC70-4) ,4 PIN,R/TP ,80mA CMOS LOW IQ LDO VOLTAGE REGULATOR / 2.5V | | |
| 6 | U203 | IC | EUSY0223002 | HVSOF5 ,5 PIN,R/TP ,150mA CMOS LDO WITH OUTPUT CONTROL / 2.8V | | |
| 6 | U204 | IC | EUSY0119002 | 4X3 UCSP / CODE : B12-4 ,10 PIN,R/TP ,DUAL SPDT ANALOG SWITCHES(Pb Free) | | |
| 6 | U205 | IC | EUSY0227901 | SON5-P-0.35(fSV) ,5 PIN,R/TP ,2-INPUT AND GATE, Pb Free | | |
| 6 | U206 | IC | EUSY0163901 | uCSP ,10 PIN,R/TP ,Dual Analog Switch, 300MHz Bandwidth | | |
| 6 | U207 | IC | EUSY0291001 | 67ball WLCSP, 64Poly+MP3 ,67 PIN,R/TP , | | |
| 6 | U301 | IC | EUSY0288701 | BGA ,84 PIN,ETC ,256(1die flash)*64(PSRAM), 3V, 8x11.6x1.2mm, 84ball, Pb-Free | | |
| 6 | U302 | IC | EUSY0227901 | SON5-P-0.35(fSV) ,5 PIN,R/TP ,2-INPUT AND GATE, Pb Free | | |
| 6 | U400 | PAM | SMPY0008301 | 35 dBm,53 %,0.0000025 A, dBc,50 dB,6.0*6.0*1.2 ,SMD ,FOR QUAD BAND GSM AND GPRS | | |
| 6 | U401 | IC | EUSY0223202 | 5.0*5.0 ,32 PIN,R/TP ,AERO11 TRANSCEIVER, D Version | | |
| 6 | U402 | IC | EUSY0077201 | SC70 ,5 PIN,R/TP ,Inverter Gate, Pb Free | | |

# 12. EXPLODED VIEW & REPLACEMENT PART LIST

| Level | Location No. | Description | Part Number | Specification | Color | Remark |
|---|---|---|---|---|---|---|
| 6 | U403 | IC | EUSY0118602 | SOT23 ,5 PIN,R/TP ,2.85V/150mA Low Noise uCap LDO Regulator, PBFREE | | |
| 6 | U501 | IC | EUSY0277901 | MLF ,10 PIN,R/TP ,Dual(1.8V/150mA,2.9V/300mA) LDO Regulator | | |
| 6 | U502 | IC | EUSY0245401 | DFN ,16 PIN,R/TP ,Main 3 LEDs(60mA) + Flash (300mA) Charge pump | | |
| 6 | U503 | IC | EUSY0240501 | BGA(6.2*7.2*1.3t) ,96 PIN,R/TP ,128Kbyte SRAM, VGA Camera IC | | |
| 6 | VA201 | VARISTOR | SEVY0003901 | 5.5 V, ,SMD ,480pF, 1005 | | |
| 6 | VA202 | VARISTOR | SEVY0003901 | 5.5 V, ,SMD ,480pF, 1005 | | |
| 6 | VA203 | VARISTOR | SEVY0003901 | 5.5 V, ,SMD ,480pF, 1005 | | |
| 6 | VA204 | VARISTOR | SEVY0003901 | 5.5 V, ,SMD ,480pF, 1005 | | |
| 6 | VA308 | VARISTOR | SEVY0003901 | 5.5 V, ,SMD ,480pF, 1005 | | |
| 6 | VA309 | VARISTOR | SEVY0000702 | 14 V,10% ,SMD , | | |
| 6 | VA310 | VARISTOR | SEVY0003901 | 5.5 V, ,SMD ,480pF, 1005 | | |
| 6 | X101 | X-TAL | EXXY0015601 | .032768 MHz,20 PPM,7 pF,65000 ohm,SMD ,6.9*1.4*1.3 | | |
| 6 | X400 | VCTCXO | EXSK0006601 | 26 MHz,2.5 PPM,10 pF,SMD ,3.2*2.5*1.2 ,Pb Free | | |
| 5 | SAFD00 | PCB ASSY,MAIN,SMT TOP | SAFD0069103 | | | |
| 6 | C301 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C302 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C303 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C304 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C305 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C306 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C307 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C308 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C309 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C310 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C311 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C312 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C313 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C314 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C520 | CAP,CERAMIC,CHIP | ECCH0000137 | 330 pF,50V ,K ,X7R ,HD ,1005 ,R/TP | | |
| 6 | C521 | CAP,CERAMIC,CHIP | ECCH0004904 | 1 uF,6.3V ,K ,X5R ,TC ,1005 ,R/TP | | |
| 6 | C522 | CAP,CERAMIC,CHIP | ECCH0000110 | 10 pF,50V,D,NP0,TC,1005,R/TP | | |
| 6 | LD301 | DIODE,LED,CHIP | EDLH0006001 | Blue ,1608 ,R/TP ,Blue SMD LED | | |
| 6 | LD302 | DIODE,LED,CHIP | EDLH0006001 | Blue ,1608 ,R/TP ,Blue SMD LED | | |
| 6 | LD303 | DIODE,LED,CHIP | EDLH0006001 | Blue ,1608 ,R/TP ,Blue SMD LED | | |
| 6 | LD304 | DIODE,LED,CHIP | EDLH0006001 | Blue ,1608 ,R/TP ,Blue SMD LED | | |

| Level | Location No. | Description | Part Number | Specification | Color | Remark |
|---|---|---|---|---|---|---|
| 6 | LD305 | DIODE,LED,CHIP | EDLH0006001 | Blue ,1608 ,R/TP ,Blue SMD LED | | |
| 6 | LD306 | DIODE,LED,CHIP | EDLH0006001 | Blue ,1608 ,R/TP ,Blue SMD LED | | |
| 6 | LD307 | DIODE,LED,CHIP | EDLH0006001 | Blue ,1608 ,R/TP ,Blue SMD LED | | |
| 6 | LD308 | DIODE,LED,CHIP | EDLH0006001 | Blue ,1608 ,R/TP ,Blue SMD LED | | |
| 6 | LD309 | DIODE,LED,CHIP | EDLH0006001 | Blue ,1608 ,R/TP ,Blue SMD LED | | |
| 6 | LD310 | DIODE,LED,CHIP | EDLH0006001 | Blue ,1608 ,R/TP ,Blue SMD LED | | |
| 6 | LD311 | DIODE,LED,CHIP | EDLH0006001 | Blue ,1608 ,R/TP ,Blue SMD LED | | |
| 6 | LD312 | DIODE,LED,CHIP | EDLH0006001 | Blue ,1608 ,R/TP ,Blue SMD LED | | |
| 6 | LD313 | DIODE,LED,CHIP | EDLH0006001 | Blue ,1608 ,R/TP ,Blue SMD LED | | |
| 6 | LD314 | DIODE,LED,CHIP | EDLH0006001 | Blue ,1608 ,R/TP ,Blue SMD LED | | |
| 6 | R215 | RES,CHIP | ERHY0000261 | 10K ohm,1/16W,J,1005,R/TP | | |
| 6 | R216 | RES,CHIP | ERHY0000241 | 1K ohm,1/16W,J,1005,R/TP | | |
| 6 | R220 | RES,CHIP | ERHY0000258 | 7.5K ohm,1/16W,J,1005,R/TP | | |
| 6 | R223 | RES,CHIP | ERHY0000261 | 10K ohm,1/16W,J,1005,R/TP | | |
| 6 | R226 | RES,CHIP | ERHY0000207 | 20 ohm,1/16W,J,1005,R/TP | | |
| 6 | R303 | RES,CHIP | ERHY0000209 | 27 ohm,1/16W,J,1005,R/TP | | |
| 6 | R304 | RES,CHIP | ERHY0000209 | 27 ohm,1/16W,J,1005,R/TP | | |
| 6 | R305 | RES,CHIP | ERHY0000209 | 27 ohm,1/16W,J,1005,R/TP | | |
| 6 | R306 | RES,CHIP | ERHY0000209 | 27 ohm,1/16W,J,1005,R/TP | | |
| 6 | R307 | RES,CHIP | ERHY0000209 | 27 ohm,1/16W,J,1005,R/TP | | |
| 6 | R308 | RES,CHIP | ERHY0000209 | 27 ohm,1/16W,J,1005,R/TP | | |
| 6 | R309 | RES,CHIP | ERHY0000209 | 27 ohm,1/16W,J,1005,R/TP | | |
| 6 | R310 | RES,CHIP | ERHY0000209 | 27 ohm,1/16W,J,1005,R/TP | | |
| 6 | R311 | RES,CHIP | ERHY0000209 | 27 ohm,1/16W,J,1005,R/TP | | |
| 6 | R312 | RES,CHIP | ERHY0000209 | 27 ohm,1/16W,J,1005,R/TP | | |
| 6 | R313 | RES,CHIP | ERHY0000209 | 27 ohm,1/16W,J,1005,R/TP | | |
| 6 | R314 | RES,CHIP | ERHY0000209 | 27 ohm,1/16W,J,1005,R/TP | | |
| 6 | R315 | RES,CHIP | ERHY0000209 | 27 ohm,1/16W,J,1005,R/TP | | |
| 6 | R316 | RES,CHIP | ERHY0000209 | 27 ohm,1/16W,J,1005,R/TP | | |
| 6 | R318 | RES,CHIP | ERHY0000220 | 100 ohm,1/16W,J,1005,R/TP | | |
| 6 | R319 | RES,CHIP | ERHY0000220 | 100 ohm,1/16W,J,1005,R/TP | | |
| 6 | R320 | RES,CHIP | ERHY0000220 | 100 ohm,1/16W,J,1005,R/TP | | |
| 6 | R321 | RES,CHIP | ERHY0000220 | 100 ohm,1/16W,J,1005,R/TP | | |
| 6 | R323 | RES,CHIP | ERHY0000237 | 680 ohm,1/16W,J,1005,R/TP | | |
| 6 | R324 | RES,CHIP | ERHY0000237 | 680 ohm,1/16W,J,1005,R/TP | | |
| 6 | R331 | RES,CHIP | ERHY0000237 | 680 ohm,1/16W,J,1005,R/TP | | |
| 6 | R332 | RES,CHIP | ERHY0000237 | 680 ohm,1/16W,J,1005,R/TP | | |

# 12. EXPLODED VIEW & REPLACEMENT PART LIST

| Level | Location No. | Description | Part Number | Specification | Color | Remark |
|---|---|---|---|---|---|---|
| 6 | R343 | RES,CHIP | ERHY0000237 | 680 ohm,1/16W,J,1005,R/TP | | |
| 6 | R349 | RES,CHIP | ERHY0000237 | 680 ohm,1/16W,J,1005,R/TP | | |
| 6 | R352 | RES,CHIP | ERHY0000237 | 680 ohm,1/16W,J,1005,R/TP | | |
| 6 | R354 | RES,CHIP | ERHY0000237 | 680 ohm,1/16W,J,1005,R/TP | | |
| 6 | R356 | RES,CHIP | ERHY0000237 | 680 ohm,1/16W,J,1005,R/TP | | |
| 6 | R510 | RES,CHIP | ERHY0000280 | 100K ohm,1/16W,J,1005,R/TP | | |
| 6 | U504 | IC | EUSY0129501 | SC-74A ,3 PIN,R/TP ,HALL-EFFECT SWITCH, Pb Free | | |
| 6 | VA301 | VARISTOR | SEVY0000702 | 14 V,10% ,SMD , | | |
| 6 | VA302 | VARISTOR | SEVY0000702 | 14 V,10% ,SMD , | | |
| 6 | VA303 | VARISTOR | SEVY0000702 | 14 V,10% ,SMD , | | |
| 6 | VA305 | VARISTOR | SEVY0000702 | 14 V,10% ,SMD , | | |
| 6 | VA306 | VARISTOR | SEVY0000702 | 14 V,10% ,SMD , | | |
| 6 | VA307 | VARISTOR | SEVY0000702 | 14 V,10% ,SMD , | | |
| 5 | SPFY00 | PCB,MAIN | SPFY0124401 | FR-4 ,0.8 mm,BUILD-UP 8 ,KG245 MAIN PCB | | |
| 5 | WSYY00 | SOFTWARE | WSYY0350401 | KG245P64-07-V10f-XXX-XX MAR 28 2006 | | |

## 12.3 Accessory

**Note:** This Chapter is used for reference, Part order is ordered by SBOM standard on GCSC

| Level | Location No. | Description | Part Number | Specification | Color | Remark |
|---|---|---|---|---|---|---|
| 3 | ADEY00 | DATA KIT | ADEY0004801 | KG245 CD Ass'y for Russia | | 59 |
| 4 | MBAZ00 | BAG | MBAZ0004701 | CD Cover | | |
| 4 | MCHZ00 | COMPACT DISK | MCHZ0015401 | | | |
| 4 | MMBA00 | MANUAL,INSTALLATION | MMBA0018501 | Installation guide for Mobile Agent | | |
| 3 | MHBY00 | HANDSTRAP | MHBY0000404 | Hand Strap 135mm | Black | |
| 3 | SBPL00 | BATTERY PACK,LI-ION | SBPL0077901 | 3.7 V,830 mAh,1 CELL,PRISMATIC ,FG101 RUSSV423450, Innerpack | | |
| 3 | SGDY00 | DATA CABLE | SGDY0004401 | DK-20G, G7000 ,Cable bulk | | |
| 3 | SGEY00 | EAR PHONE/EAR MIKE SET | SGEY0003204 | L1200 ,MONO TYPE | | |
| 3 | SSAD00 | ADAPTOR,AC-DC | SSAD0007828 | 100-240V ,60 Hz,5.2 V,800 mA,CE,CB,GOST ,EU PLUG(24P),STD | | |
| 3 | WSAY00 | SOFTWARE,APPLICATION | WSAY0041401 | 060321_KG245_CIS | | |

## Note